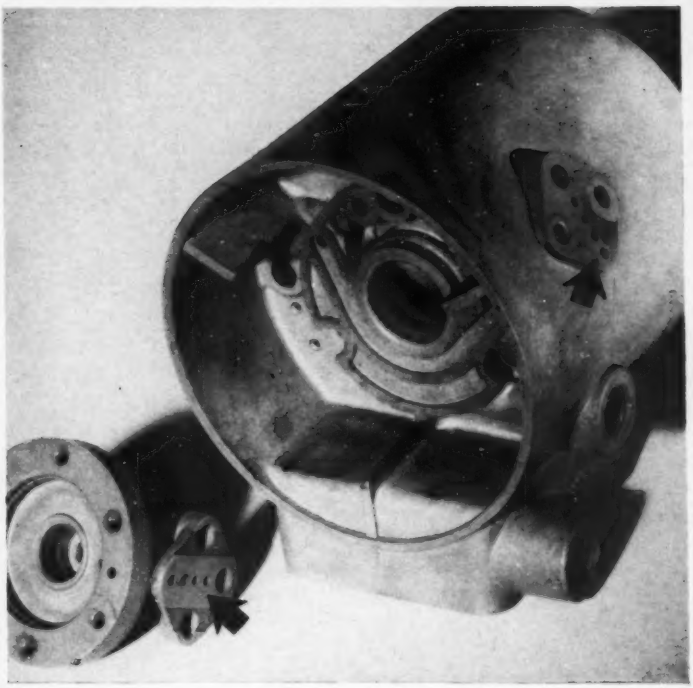
DIE CASTINGS

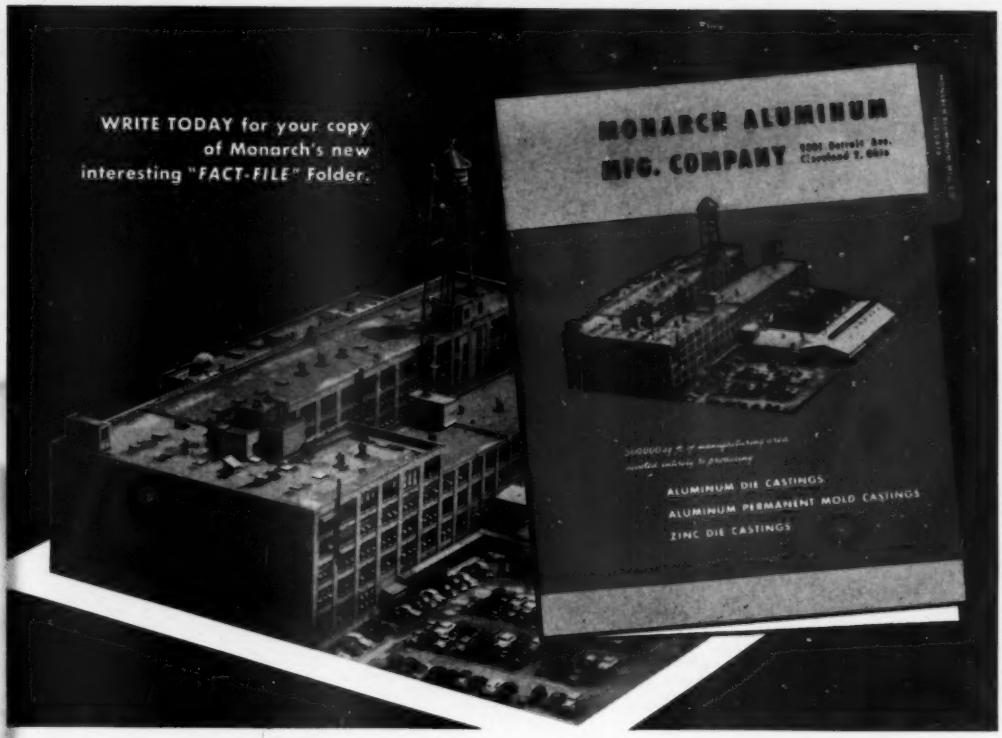
INCLUDING A SPECIAL FINISHING SECTION

June 1951



Coring Stops Porosity Rejects

THE PRODUCT DESIGN MAGAZINE FOR USERS AND POTENTIAL USERS OF DIE CASTINGS


WRITE TODAY for your copy of Monarch's new interesting "FACT-FILE" Folder.
MONARCH ALUMINUM MFG. COMPANY
ALUMINUM DIE CASTINGS
ALUMINUM PERMANENT MOLD CASTINGS
ZINC DIE CASTINGS

MONARCH OFFERS MORE than just castings

Monarch's Mobilized Facilities represent an unusual type of integrated service... which few foundries are in a position to offer. These facilities are available for many individual services which may be completely independent of casting requirements.

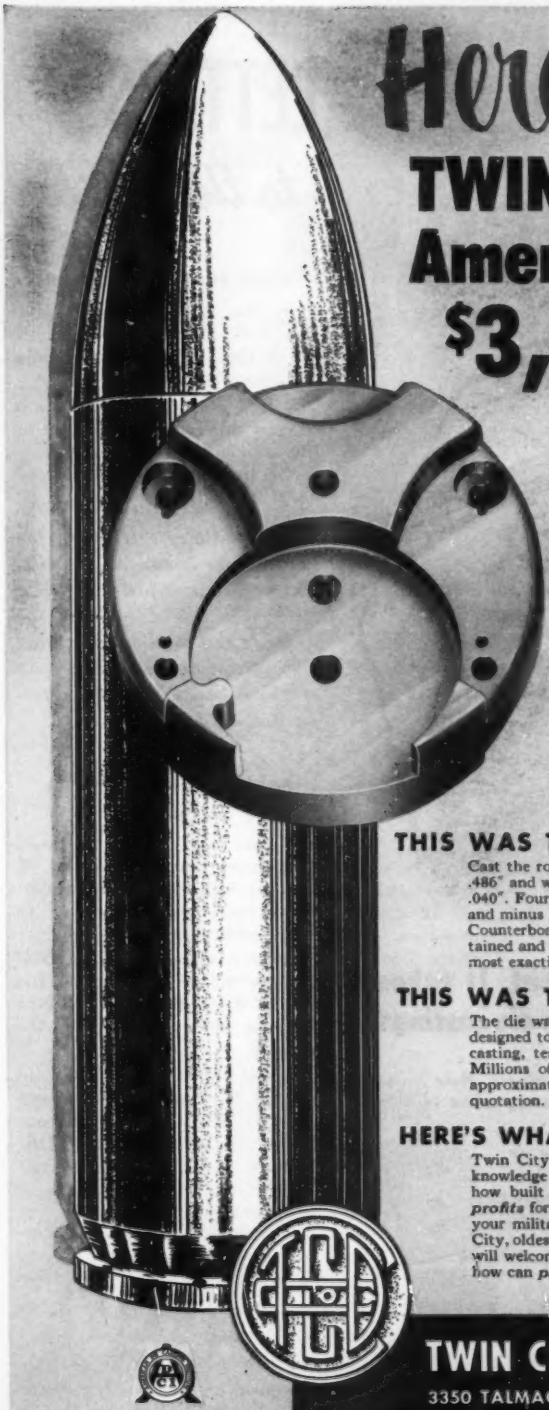
Monarch's casting production in aluminum permanent mold, aluminum and certified zinc die castings is recognized throughout industry. Monarch offers the obvious benefits of this coordinated service... *in one plant, under one management.*

Monarch's modern trimming and machining methods are capable of meeting unusual mass production requirements within all specifications for quality control.

Monarch's unusual finishing facilities, including complete production of commercial products, offer modern assembly capacity with skilled personnel. Monarch can assume assembly operations to relieve your production problems or eliminate multiple sub-contract operations.

Monarch Offers More Than Just Castings... an integrated service organization worthy of your consideration on your current defense planning problems.

MONARCH ALUMINUM MFG. COMPANY • Detroit Avenue at West 93rd Street, Cleveland 2, Ohio



Here's how...

TWIN CITY saved American taxpayers $3,710,000...

...by casting this Ammunition Rotor Housing at 1/17 of the previous cost!

Machined from brass at the outbreak of World War II, these rotor housings were costing the American taxpayer approximately 57¢ apiece. That was the *tangible* cost . . . slow production, extra man-hours, tie-up of critical machinery were the costly intangibles. Several die casters were of the opinion that the small holes in the intricate housing were impractical for die casting. Then, Twin City was called in.

THIS WAS THE JOB:

Cast the rotor housing with a diameter of 1.310", a thickness of .486" and with eleven cored holes in the casting, some as small as .040". Four .076" dia. holes had to be held to a tolerance of plus and minus .0005" and 2 holes .093" dia. plus .0000" minus .0005". Counterbore cores were necessary. Tolerances had to be maintained and each hole had to be relative to every other point . . . a most exacting job.

THIS WAS TWIN CITY'S ANSWER:

The die was made in Twin City's own shop. Special tooling was designed to insure uniformity of subsequent impressions. During casting, temperature of the dies was automatically controlled. Millions of rotor housings were produced to specifications at approximately 1/17th of the machined cost, and at a price below quotation.

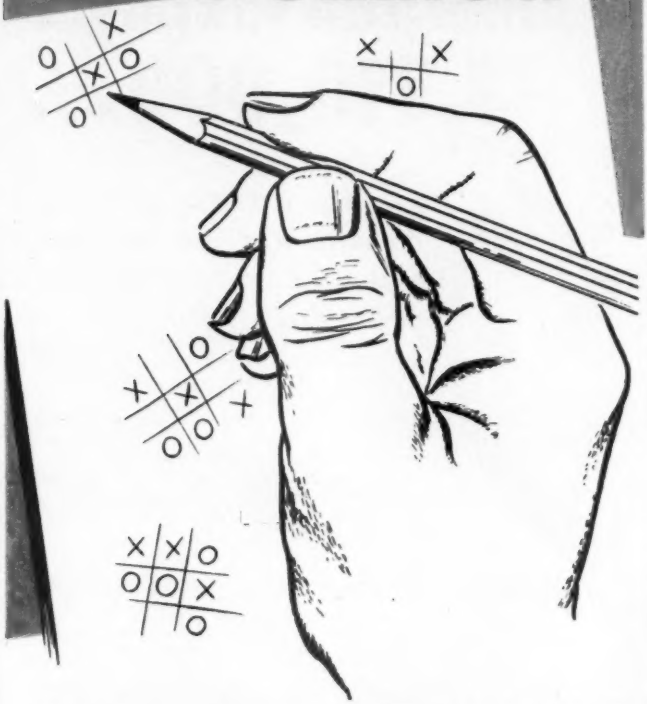
HERE'S WHAT THIS CAN MEAN TO YOU!

Twin City's ability to tackle the difficult . . . its die-designing knowledge and die-making ingenuity . . . ***plus*** a casting know-how built on over 30 years of experience, can ***cut costs***, show ***profits*** for you! If these are the things you are looking for to meet your military or essential civilian production . . . contact Twin City, oldest die casters in the upper Midwest. Twin City engineers will welcome the opportunity to show how ingenuity and know-how can ***pay off for you!***

TWIN CITY DIE CASTINGS CO.

3350 TALMAGE AVE. S.E. · MINNEAPOLIS 14, MINN.

Are You Puzzled?



Yes, die castings are different. It takes more than machines to produce die castings.

Die Castings are Newton-New Haven's business. Here is an organization that has production and engineering talent to help you with your die casting problems.

Newton-New Haven has prepared a booklet on "Dimensioning Die Castings." This is basic data that every Engineer and Designer should have. Write on your company letterhead for your copy.

NEWTON NEW HAVEN

THE NEWTON-NEW HAVEN COMPANY

689 THIRD AVENUE • WEST HAVEN 16 • CONNECTICUT

LETTERS *to the Editor*

BRASS PLATING SOLUTION

In the early part of 1950, Jan., Feb., Mar., you ran an article on the analysis of Ammonia in brass plating solution.

Would you kindly send me a copy of this issue or a reprint of the article on Ammonia Analysis in brass plating solution.—M. M.

The article referred to by the reader was a two-part article which ran in April and May, 1950, and was devoted to the methods and solutions for brass plating zinc die castings. Copies of these issues have been forwarded.—Ed.

FILLING IN NUMBERS FOR LEGIBILITY

We are looking for a material sold under the trade name of Lacquer-Stik which we understand has been advertised in your publication.

It is a crayon-like material used to fill in numbers on the face of die castings in order to increase the legibility of the number.

Would you be kind enough to send us the name of the manufacturers if you have it. We understand they are located in the Chicago area although it is not definite.—A. D.

The product called Lacquer-Stik is manufactured by Lake Chemical Company, 3061 W. Carroll Ave., Chicago 12, Ill. It is a material in stick form which is wiped into recessed lettering, numbers or designs to make them more readable.—Ed.

DO's and DON'Ts in DESIGNING ZINC and ALUMINUM DIE CASTINGS

examples by DOLLIN

PRINCIPLE: Wherever possible, parting lines should be positioned so that seams are removed automatically in the course of an expected machining operation.

EXAMPLE: The original design for this cake decorator top required two operations after casting: (1) boring the critical inside diameter and cutting groove **a** (2) scraping seam **b** out of the breech lock by hand.

Dollin engineers suggested re-positioning the seams at **b'** (second picture — Dollin casting before machining), so that removal would be automatic when the i.d. was bored.

Picture three shows the Dollin casting ready for plating. Preparation required only one operation — boring the i.d. In addition, groove **a'** was extended (as shown) to increase the attractiveness of the part, and make it easier to keep clean.

RESULT: Lower costs and an improved product for the manufacturer.

Dollin engineers will work with you on design refinements, recommending whatever changes will simplify the die casting operation, improve the soundness of the castings, or eliminate machining, finishing, or assembly operations. They have at their disposal extensive, modern facilities, and are thus free to adapt designs for lowest final cost.

Dollin can efficiently produce all commercial sizes of die castings — facilities include large plunger zinc machines, large and medium size cold chamber high pressure machines, and a separate small castings department. Write for estimates and engineering advice at no obligation.

SPECIAL SMALL CASTINGS DEPARTMENT

For low die and casting costs: small single or double cavity dies—high speed automatic machines.

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JUNE 1951
Vol. 9 No. 6

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COVER—INTERSECTING SMALL HOLES and passages were a problem for the Williams Oil-O-Matic Div., Eureka Williams Corp., in the manufacture of the Model 50-10 oil burner. When these holes, 0.100 in diameter and 1.5 inches deep, were drilled, internal porosity caused leakage between the passages. The die casting supplier took on the problem, and by careful attention to detail, succeeded in coring these holes. See article on page 32.

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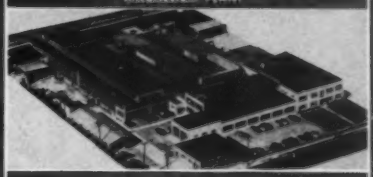

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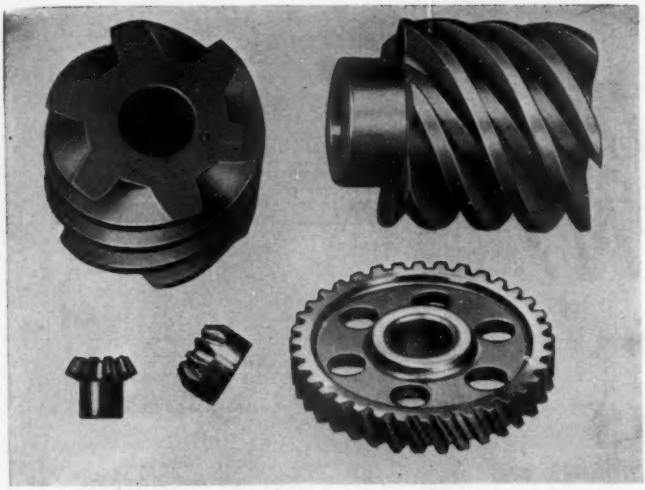


Die Cast GEARS may be the *Solution* to one of *Your Problems*

NOTE: We do not stock standard gears, but die cast them to customers' specifications only.

When gears are needed for a particular assembly . . . especially for volume production . . . a number of problems present themselves. Cost is usually the most formidable problem because it involves such factors as machining, finishing, cleaning or other conditioning for assembly. Dimensional tolerances, durability and strength are other factors which may have to be considered.

In recent years, a number of manufacturers have turned to MILWAUKEE for gears to be used in light assemblies. They have found that die-cast gears have the necessary strength, hardness and stability for the purposes intended . . . and that they usually result in collateral advantages of considerable value.

These Advantages Include:

LOW COST — resulting from a substantial saving over gear cutting and other machining operations.

DIMENSIONAL ACCURACY — tolerances may be held within a few thousandths of an inch.

READY FOR ASSEMBLY — die cast gears, as a rule, are ready-for-assembly when delivered.

Worth Investigating

The next time you need small, lightweight gears in quantity, check into the possible benefits of having them die cast by MILWAUKEE . . . to your specifications.

MILWAUKEE DIE CASTING COMPANY
1019 N. FOURTH STREET • MILWAUKEE 3, WISCONSIN

A 5901-2/3

LITERATURE AND SERVICES OFFERED IN THIS MONTH'S ADS

NOTE: Circle numbers on the enclosed postcard to indicate literature, samples or trial services you wish to receive.

No. 1. A FOLDER DESCRIBING THE MONARCH Aluminum Mfg. Co.'s plant and its zinc and aluminum die casting facilities is available from the company.

No. 2. EXAMPLES OF DIE CASTINGS in zinc and aluminum made by the Tri State Die Casting Co. are shown in a catalog offered by the company.

No. 3. DIE CAST MACHINING OPERATIONS utilizing Bellows Co. "Controlled-Air-Power" devices are shown and described in two booklets, "Faster, Safer, Better Production" and Foto Facts File FF47-778.

No. 4. SIMULATED PLATED FINISHES are given to die castings with Platelustre, a paint recently marketed by the Maas & Waldstein Co. Literature is available on this product, which may be used to simulate copper, brass or bronze plating.

No. 5. SAMPLES OF TINY DIE CASTINGS and bulletins covering production facilities are offered by the Gries Reproducer Corp. This company specializes in very small zinc die castings.

No. 6. PYDRAUL F-9 HYDRAULIC FLUID is described in Technical Bulletin No. O-D-602, available from the Monsanto Chemical Co. F-9, a non-flammable compound, was developed primarily for use in die casting machines.

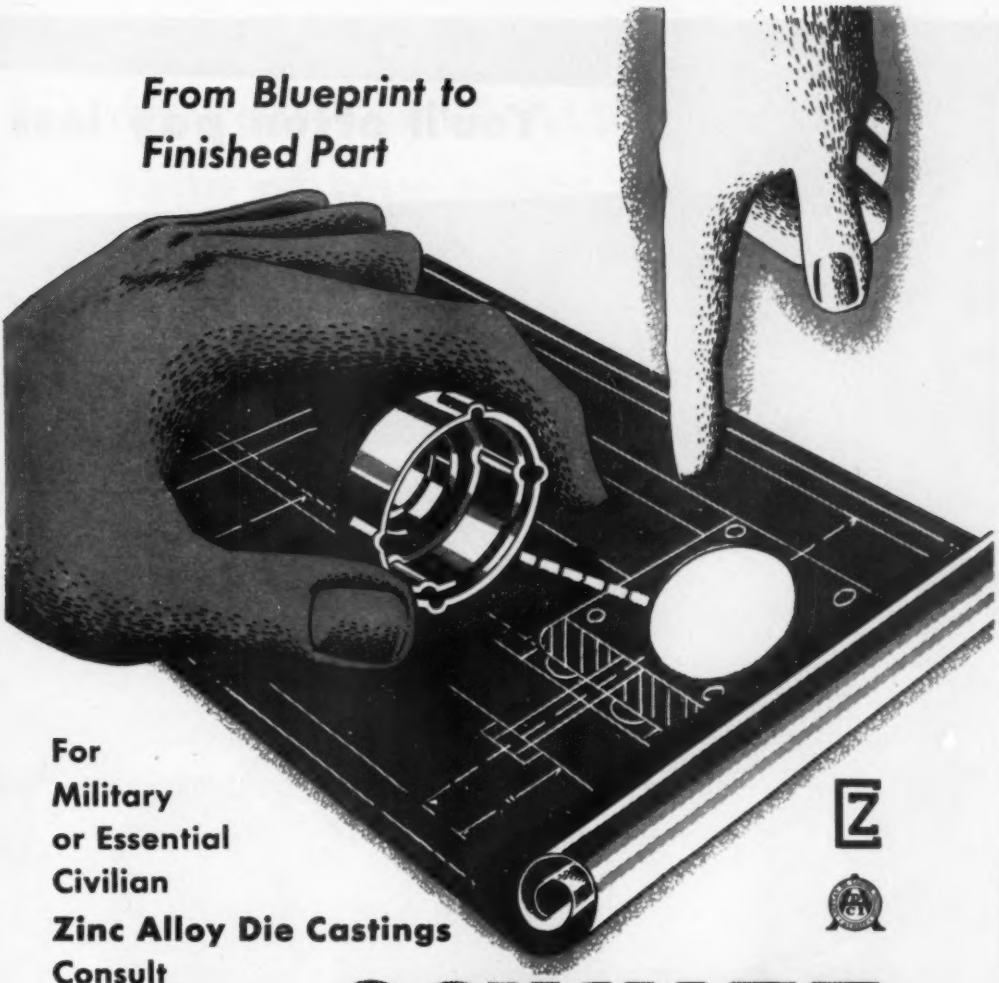
No. 7. A FINISH SIMILAR TO CHROME can be obtained by coating a bright zinc plate with Iridite, according to Allied Research Products, Inc. A company technical bulletin gives the details.

No. 8. THE REMOVAL OF PAINT, GREASE AND DIRT from metal products with solvent detergents is the subject of a 24-page booklet offered by Oakite Products, Inc.

No. 9. LITERATURE AND DESIGN INFORMATION on aluminum and magnesium die castings are available from Litemetal Die-cast, Inc.

(Continued on Page 10)

From Blueprint to Finished Part



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Our ability consistently to furnish dimensionally accurate castings with superior surface finish has established us as a leading supplier of zinc base alloy die castings. Our engineers will welcome the opportunity of demonstrating how these advantages can be incorporated in your products.

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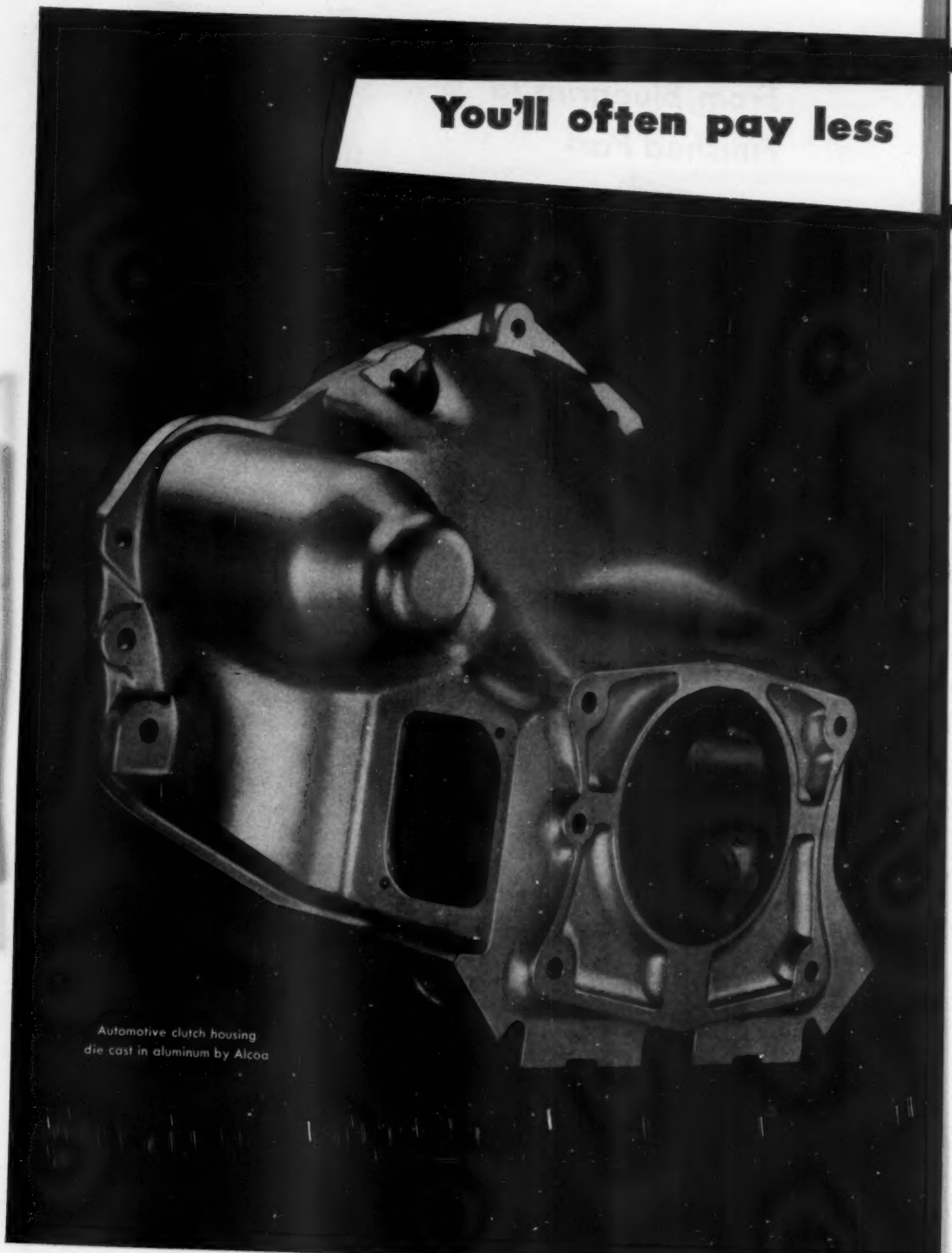
You'll often pay less
Automotive clutch housing
die cast in aluminum by Alcoa

for die castings of ALUMINUM than of any other metal!

A pound of aluminum can make three times as many die castings as a pound of heavy metal. This means that there is a point in the cost-weight ratio where aluminum die castings are less expensive. Let us quote on your die casting requirements—they may cost less in aluminum. If your casting is exceptionally large or complex, it's almost certain that it will cost less in aluminum than in any other metal.

So far we've talked only about the casting's cost as supplied to you. What will you pay to machine and handle it? Alcoa Aluminum Die Castings are easy to machine. Handling and shipping are less expensive.

Your local Alcoa die casting expert will gladly work out these cost factors with you. Include Alcoa in the bidding on your next job. Look under "aluminum" in your classified phone book. Or write ALUMINUM COMPANY OF AMERICA, 1895F Gulf Building, Pittsburgh 19, Penna.

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A sound, time-tested institution and a sound time-tested product have won confidence and widespread endorsement.

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Detroit Chicago Pittsburgh
Philadelphia New York

LITERATURE AND SERVICES

(Continued from Page 6)

No. 10. "HOW TO DIMENSION PRINTS FOR DIE CASTINGS" is the title of a booklet offered by the Newton-New Haven Co. The booklet gives detailed instructions for guidance in dimensioning die casting drawings.

No. 11. "ADVANCED BARREL FINISHING" is the title of a booklet offered by the Almco Div., Queen Stove Works, Inc. The booklet gives details of the Supersheen method of controlled barrel deburring, grinding and finishing.

No. 12. A COMPACT, COMPLETELY AUTOMATIC DRILL HEAD with self-contained air and controlled feed and speed is described in a catalog offered by the Dumore Co.

No. 13. DIE CASTING ACCESSORY EQUIPMENT, including ingot molds, melting pots and other molten metal handling equipment are described and illustrated in C. H. Milles Foundry Co.'s Catalog No. 101.

No. 14. "DESIGNING FOR DIE CASTING" is the title of a booklet offered by the New Jersey Zinc Co. The booklet shows how castings can be improved and money saved by proper design.

No. 15. BURNISHING MIXTURES and suggestions on how to use them are contained in a catalog issued by the Abbott Ball Co. The company manufactures burnishing shapes made of bearing ball steel in many shapes and sizes.

No. 16. SAMPLES AND LITERATURE on the Tap-Lok screw thread insert will be sent by the Groov-Pin Corp. The Tap Lok insert cuts its own thread in cored or drilled holes and is made of hardened steel.

No. 17. DATA SHEETS ON METAL TREATING PRODUCTS manufactured by the Neilson Chemical Co. are offered by the company. Request for information should include the government specification number of the product in question.

No. 18. ENAMEL FILLING of recesses in die cast parts is illustrated and described in literature offered by the Acromark Co.

No. 19. BACKSTAND BELT GRINDING AND POLISHING and its advantages over other methods are discussed in a Coated Abrasives Div., Armour & Co., booklet. The booklet also shows equipment needed for backstand belt work.

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Dependability is Assured here!

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When considering a manufacturing procedure, therefore, remember not only the outstanding economies inherent in die casting, but also

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(1) Consultation — M. V. can help you with design and production problems by making recommendations based upon your specific requirements.

(2) Die Making — M. V's up-to-the-minute tool and die shop equipment, plus long experience and highly skilled personnel, assure a dependable source for quality dies.

(3) Castings — M. V. castings, meeting ADCI standards, are guaranteed "on grade" at all times.

(4) Machining — M.V. machining facilities can handle every machining operation that castings may require.

We shall welcome the opportunity to serve, and assist you—as we have assisted many others—to increase your output, improve your products, and *hold down your production costs.*

MT. VERNON
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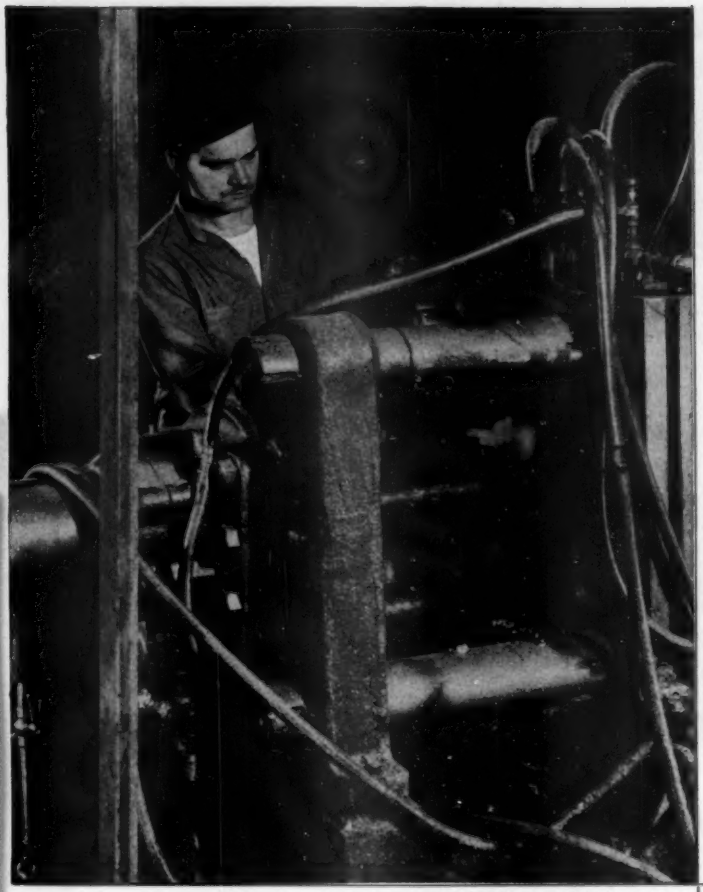

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Pydraul F-9, Monsanto's nonflammable-type hydraulic fluid, means *greater safety* for employees, *greater safety* for equipment, *greater safety* for buildings.

This greater safety comes from the nonflammability of Pydraul F-9, which has demonstrated resistance to flammability in numerous tests such as these:

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PYDRAUL F-9

Physical and Chemical Properties

Appearance	Clear, oily liquid
Color	Light amber (APHA 350)
Specific Gravity	1.266
Weight per Gallon	10.56
Acidity (mg. KOH/gm.)	Less than 0.1
Odor	Mild, pleasant
Pour Point	+5° F.
Hydrolysis Stability	Neut. No. less than 0.1 before and after hydrolysis.
Autogenous Ignition Point	Above 1100° F.
Viscosity at 100° F.	49.5—58.0 Centistrokes 229—269 S. U. S.
at 210° F.	5.6—6.0 Centistrokes 44.5—45.8 S. U. S.

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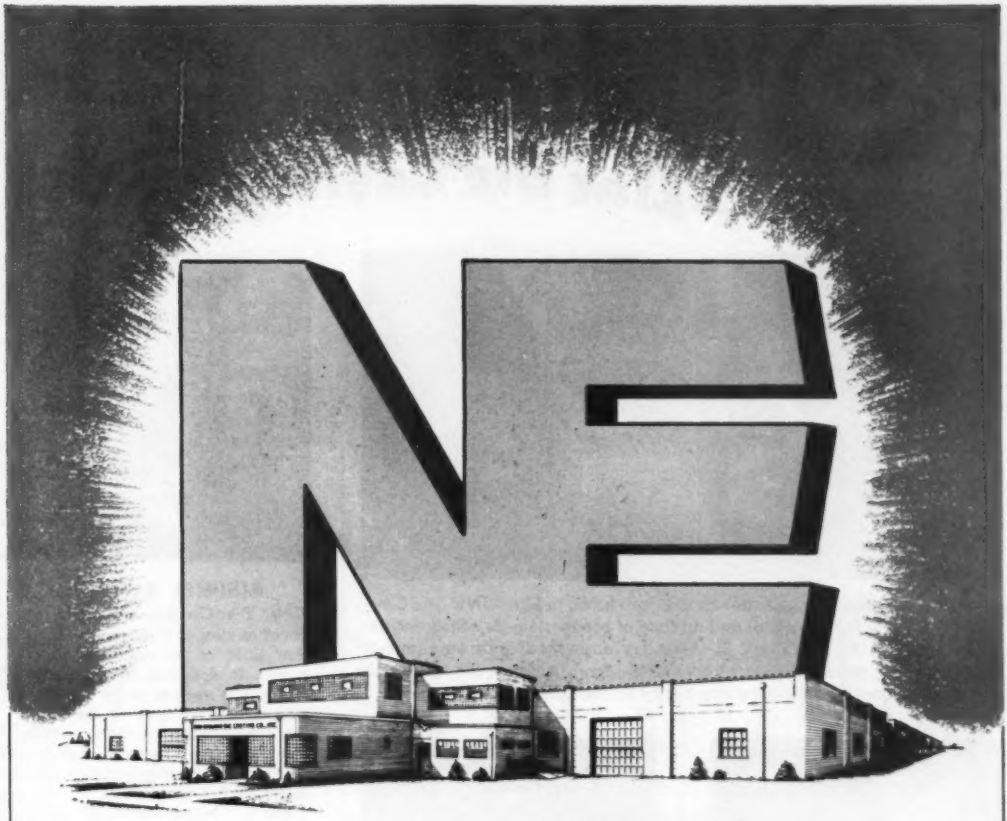

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Chas. W. Ohse, President

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THE NEW ENGLAND DIE CASTING CO.

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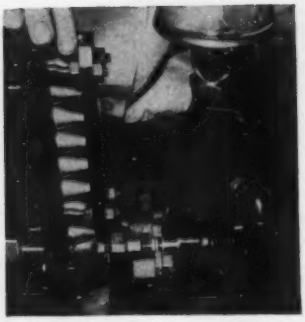
For Defense or Civilian use—get the mo$t for your Zinc Die Ca$ting Dollar!

Whether for defense or essential civilian products, design ZINC Die Castings *specifically* for this metal and method of production—to achieve maximum economy. The two ZINC Die Cast fuse noses for 20 mm. ammunition pictured above were designed to give Uncle Sam the most for his dollar. The same economic considerations apply to essential civilian castings.



MINIMIZE MACHINING

ZINC Die Castings are often produced so close to finished dimensions that little or no machining is required. In designing the fuse noses, however, it was less costly to cut the external threads than to cast them. Since the ZINC alloy is free-cutting, this operation is performed at high speed in a lathe fitted with an automatic feeding mechanism.

For a working knowledge of the full economic possibilities of ZINC Die Castings for defense or essential civilian products, ask us—or your die caster—for a copy of "Designing For Die Casting."

UTILIZE MULTIPLE PRODUCTION

Using a die designed to produce 12 fuse noses at a time, on a "gate" which is cast at the rate of 225 to 250 per hour, over 2700 noses are produced every 60 minutes in a plunger-type die casting machine. Of the most used die casting metals, only ZINC alloys can be used in these high speed machines.

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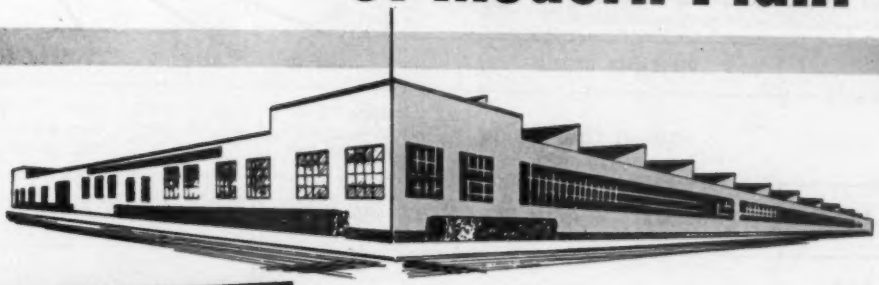

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DESIGNATION & COMPOSITION OF ZINC DIE CASTING ALLOYS:

	REFERENCE DESIGNATION	ALLOY 2	ALLOY 3	ALLOY 5
	NOMINAL COMPOSITION	Copper 2.5-3.5% Alum. 3.5-4.5% Mag. .02-.10%	Alum. 3.5-4.3% Mag. .03-.08%	Copper .75-1.25% Alum. 3.5-4.3% Mag. .03-.08%
ASTM	*American Soc. for Testing Materials*	*B86–XXI*	*B86–XXIII*	*B86–XXV*
SAE	*Society of Automotive Engineers*	*921*	*903*	*925*
NAVY	*U.S. Navy*		*46Z2b–Class A*	*46Z2b&c–Class B*
ARMY	*U.S. Army*		*57-93-2A Alloy A*	*57-93-2A Alloy B*
FED	*Federal Specifications*		*QQZ–363A*	*QQZ–363B*

The phenomenal growth of the die casting industry—the second largest consumer of zinc today—was chiefly provided by the development of "four-nines" metal—which is standard for all zinc alloy die castings.

Prior to 1928, the year Bunker Hill pioneered the production of "four-nines" metal, zinc die castings based on lower grade metal were restricted in their applications due to limitations in physical properties. But as soon as industry was enabled to write "balance 99.99+% zinc" into their specifications, the quality and stability required in die castings were available and the use of zinc alloy castings increased enormously. Die Casting—the shortest distance between raw material and finished product—proved the answer to industry's need for accurate, high-speed and low-cost production of the most complex parts, in a single operation, just as zinc has proved itself as the ideal base metal for die castings. Currently over 70% of all die castings by weight are made of zinc.

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Perhaps Hoover Die Castings can cut costs or improve the sales appeal of YOUR product. Talk it over with a Hoover sales engineer. We'll be glad to have one call on you, without obligating you in any way. THE HOOVER COMPANY, Die Casting Division, North Canton, Ohio.
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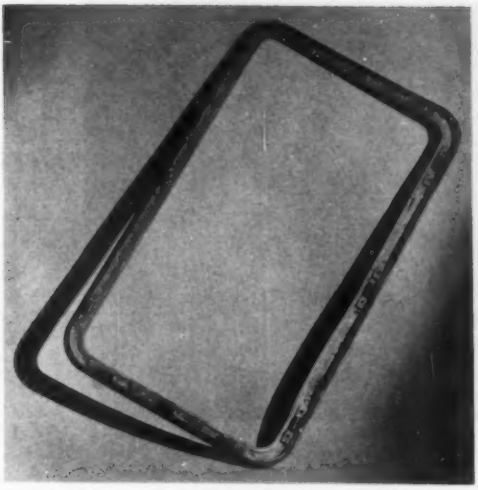


TO FRAME A METER, DIAL, GAUGE or other glass-covered area, the use of a die cast zinc bezel gives a close-fitting, easy to seal rim. This closure for the indicating dial on a gasoline pump has a smooth external surface which takes a high quality finish.

How To Frame a Glass Closure

WHEN, several years ago, Erie Meter Systems, Inc., of Erie, Pa., decided to improve the closure for the dial opening of its gasoline pump cabinets, the die cast aluminum frame that was adopted solved three major problems:

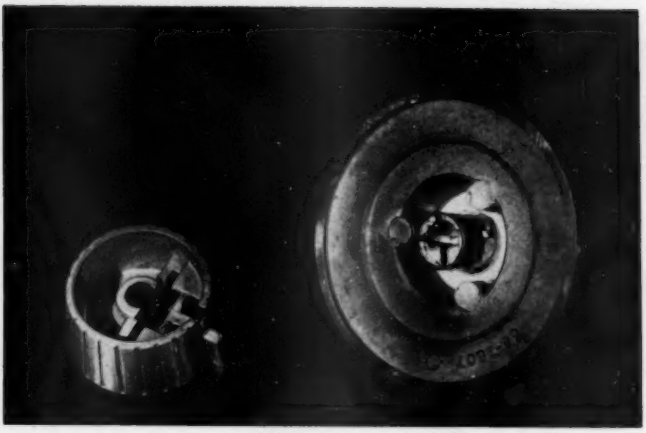
1. Brought a saving estimated up to 50 per cent of the cost of a stamped framework (which holds the glass over the dial face);
2. Avoided the cost of redesigning the entire cabinet door;
3. Provided a frame that could be used both on current production and as a replacement part on existing equipment in the field.

A simple modification of gasoline pumps already in use permitted installation of the die cast framework. If it had been necessary to make two different parts, high tooling costs would have been entailed.

While the framework is a minor part of the total assembly, especially as compared with the intricate mechanisms of the meter and computing register, it does serve an important function nevertheless. It protects the equipment by sealing off the dial face, and it frames the "business part" of the machine which is the focus of the customer's attention.

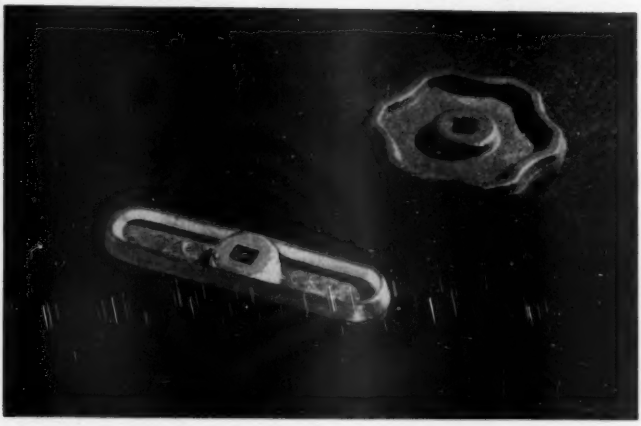
Since the manufacturers of many types of equipment—business and vending machinery, scientific instruments, industrial metering or controlling devices and light machinery, to mention a few—are frequently

(Continued on Page 59)



CAST KEYWAYS OR FLATS can often be used to simplify attaching the knob to its shaft. The auto heater control knob, *left*, has a cored slot for a flatspring which presses against a flat milled on the shaft. In addition to mounting features, die cast knobs can include knurling for easier finger grip, pointers, position indicators and other special elements.

AUTOMOBILE DOOR HANDLES are almost universally produced as zinc die castings because of the combination of strength, smooth surfaces and unlimited possibilities for styling. These door and window handles for a Ford car have a special cross flange by which they are spring-mounted onto their shafts.



IN PLACE OF FORGINGS, these two functional plumbing handles are now die cast in zinc and need only flash trim to make them ready for use. Cost considerations have been the major factor in designing this type of handle to be die cast.

SOME CONSIDERATIONS IN THE DESIGN OF HANDLES AND KNOBS

ONE of the less spectacular but thoroughly satisfactory jobs being done by die castings is in the design of thousands of types of handles, knobs, dials and drawer pulls. The amount of engineering skill which goes into the design of these relatively simple elements is not generally recognized.

In the majority of cases strength is a basic consideration, although this must usually be coupled with style, comfortable grip, easy attaching, low unit cost and dependability for the life of the product.

Proof of the adaptability of die cast zinc and aluminum for these manifold jobs lies in the large number of current applications which are so commonplace as to be almost "standard parts":

Automotive—automobile door handles, window operating levers and instrument panel control knobs;

Household appliances—refrigerator and stove handles, operating knobs and levers, carrying handles;

Plumbing and hardware—valve handles, sink fittings, door knobs, lock knobs, casement window control handles, adjusting dials and cabinet handles;

Furniture—decorative pulls for bedroom, living room, kitchen and office furniture;

Business and vending machines—operating knobs, selector buttons, typewriter shift levers, duplicator handles and dispensing controls.

CARRYING HANDLES can be die cast because the available alloys have high strength characteristics. Perspiration-proof finishing has been developed, and the carrying handle for this Philco portable radio has a brass plating protected by a clear, baked lacquer.

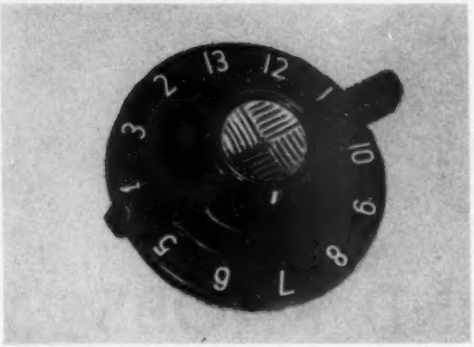
The list could be extended to include radios, portable tools, photographic equipment and other fields of manufacture, but the few applications mentioned above indicate a wide range of usefulness for die cast handles and knobs.

For some types of products such as heavy machinery, handles or knobs may be the only components required in large enough quantities to justify die casting die costs; in most products, however, die cast handles are likely to be only one of several die cast components.

Methods of Fastening

One reason for the general popularity of such die cast knobs and similar parts is the ease with which they can be attached.

Fastening by cold forming—When zinc alloy is used, a variety of crimping, spinning, peening or other cold-forming processes can be used for fastening. A boss can be cored hollow,



COATING OF BLACK ENAMEL on this die cast zinc television knob, with white paint wiped into depressed numerals for legibility, provides an attractive and inexpensive finish.

inserted through a hole in another component, and spun over to make a permanent assembly.

Cored keyways—The ability to core an irregularly shaped hole is useful for making keyways or flats in cored holes. By this method, a shaft with a key or a flat can be fitted into the die casting without any additional machining. This method is quite common for fastening radio, television and electronic knobs. A cored crosshole can be tapped and used for a setscrew to hold the shaft.

Where considerable torque is encountered, the hole can be cored with a spline to give maximum internal surface.

Tapped or threaded fastening—With fastening holes cored to size, the most frequent secondary operation consists of tapping the hole for a machine screw. In many instances, even this simple operation can be eliminated by using self-tapping screws. The character of the metal, whether zinc, aluminum or magnesium, lends itself to thread cutting action of these screws.

Where a coarse or shallow thread can be used, it is occasionally possible to core it externally. Thus, a boss can be given a thread eliminating any machining but flash removal.

Inserts for fastening—At times, the mechanical strength of the die cast alloy requires the use of an insert of another metal where heavy stress may be applied to the handle. Thus, a steel insert can be cast in place and threaded.

Clip-on type fastenings—Like the ability to core an accurate hole, the ability to form an accurate boss is a useful adjunct for fastening a handle. Bosses formed on the underside of a die casting can be inserted through cored or pierced holes in the mounting piece; Speed-Nuts which are spring steel, self-fastening clips, are then slipped over the bosses to complete the assembly quickly, simply and permanently.

Screw thread inserts—Where there is danger of a tapped thread being stripped due to excessive torque beyond the shear strength of the material, or where a screw is likely to be inserted and removed many times, special inserts of tool steel, phosphor bronze or stainless steel are available. These reinforce and protect the thread surface.

External Forms of Knobs

The functional usefulness of handles and knobs can generally be enhanced by means of special features possible by die casting.

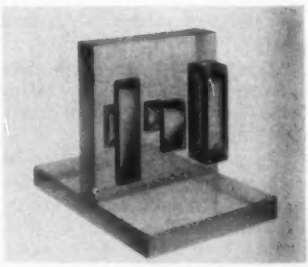
Knurling or fluting—For easier gripping, the OD of round or cylindrical knobs can be knurled, fluted or given some other finger-hold. This can be

(Continued on Page 60)

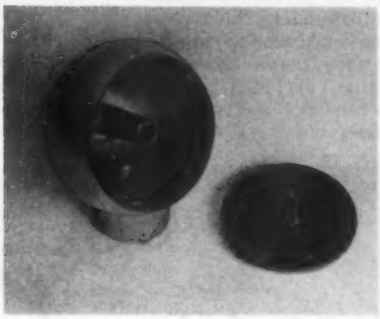
FOR FURTHUR INFORMATION on processes, machinery and fasteners mentioned in articles in this issue, circle the appropriate number on the Reader Service Card and mail it. No postage required.

Item	Page Where Mentioned	Reader Service Card Number
Self-tapping screws	(Page 24)	248
Clip-on type fasteners	(Page 24)	249
Screwthread inserts	(Page 24)	250
Two-station boring machine	(Page 33)	251
Process for chrome plating on aluminum	(Page 37)	252
Screw machine with turret	(Page 40)	253
Multiple drill attachment for single spindle drill press	(Page 41)	254
Machine for tumbling and abrasive blasting simultaneously	(Page 41)	255

LOCATION OF THE PARTING LINE around this type of handle makes finishing more difficult, but allows integral mounting, latching and hinging arrangements which would be impossible or too expensive by any other method of fabrication.



1. TO PREVENT CHIPPING of the vitreous enamel on the brass nameplate, a special type of construction for this draft beer knob has been designed.



2. BY PLACING A SPRING CLIP over the stem brazed onto the nameplate, and pressing it into the hole cored into the die cast boss, a permanent assembly is made without chipping the edges of the enamel surface.

Combination of Materials For Jewelry Effects

WITH the rise of the automobile industry, a manufacturing jeweler located in Cincinnati, Ohio, began to turn out embossed nameplates for the newfangled horseless carriages. Later, as the home appliance field began to expand, he adapted the methods and styling used in the auto business to fabricate nameplates and other decorative accessories for these household products.

This company, now specializing in the manufacture of all types of nameplates, escutcheons, emblems and trademarks, is the Fox Company. Many leading makes of cars, refrigerators, stoves and other products are identified by a colorful nameplate formed and finished in their plant.

Naturally, they utilize a wide variety of materials and finishing techniques, and it is no surprise that one of the important methods used to achieve the jewelry quality so necessary for decorative nameplates is the die casting process.

Whether die cast zinc or stamped brass will be used for a specific nameplate depends upon the individual design problem — sometimes the detail and finish can be obtained at lower cost one way, sometimes the other. Occasionally a combination proves to be more successful.

Two examples of the way in which die cast zinc with brilliant chrome plate can be used to advantage in combination with stamped brass or molded plastic are shown here.

The knob for a beer dispenser, shown assembled in Figure 1 and disassembled in Figure 2, consists of a formed brass disc with a vitreous enamel nameplate mounted into a die cast zinc spherical knob.

Some clever product design, taking advantage of the die casting process, has made it pos-

sible to clamp the nameplate firmly into the die cast knob without chipping the enamel.

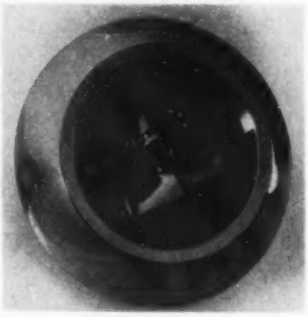
The conventional method of mounting the brass disc would have been to set it into the rabbeted opening in the die casting, and spin over the edges of the zinc alloy for permanent assembly. Unfortunately, this type of operation would tend to chip the edges of the vitreous enamel which is actually a layer of brightly colored glass fused onto the stamped disc.

The Fox Company has planned this knob with a hollow boss formed at an angle in the center of the hollow sphere. The brass disc has a short stem brazed onto its inner surface. To assemble the two parts, a special spring steel clip is slipped over the stem which is then inserted into the hollow boss. Compression of the spring grips the inner surface of the boss and makes a permanent assembly without peening, spinning or otherwise endangering the enamel.

Since this beer dispenser knob is a standard item manufactured with various brand names, the embossed company identification on the reverse side of the knob which faces the bartender is stamped into the die casting, rather than being engraved into the die.

Another combination, this time involving three materials, is the horn assembly for the Lincoln automobile, Figure 3. This unit possesses the highest degree of jewelry finish and demands the utmost care at every step of the process, from the construction and polishing of the die casting die, down to the final chrome plate.

The horn assembly consists of a chrome plated die cast ring in which are mounted a two-piece stamped brass medallion and a transparent plastic disc. A stamped copper disc forms the backplate for the assembly which is held together with four thread cutting Phillips head screws.



3. SIMPLE BUT DIFFICULT: paradoxically, the simplicity of the circular die cast frame for this horn assembly makes it difficult to produce with a perfect, unblemished surface.

Simplicity of the cleanly beveled die cast ring is misleading, for this part is not easy to produce with perfect surface. Great care has been taken in proper die design to get a part which has a so-called "hardware finish" as cast, free of flow marks,

(Continued on Page 63)

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...made of special heat resisting alloy iron for melting of Zinc, Aluminum, Lead, Babbit, Die Cast and other non-ferrous metals.

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Wilcox, Laine Address

Conference On Zinc Supply

No increase in supply is seen for near future . . . small Die Casters need relief

Forecasts of a continuing tight supply of zinc were given at the 33rd annual meeting of the American Zinc Institute, Inc., on May 22 in St. Louis.

Addressing the group at the opening of the morning session, R. L. Wilcox, head of the Non-Ferrous Metals Branch of the Economic Cooperation Administration, reviewed the current world zinc supply situation.

Mr. Wilcox stated that mine and smelter production failed to keep pace with demand in 1950, and that the year's high level of production was attained only by significant reductions in both slab and ore inventories. He also emphasized the need for increased mine production in order to minimize dependence on imports of ores and concentrates.

Even higher prices in world zinc markets were forecast by Mr. Wilcox, and he said that the 1950 production rate can be maintained through 1951 only by imports and a further reduction of stocks of the mine product.

In addressing the group on the outlook for die castings in 1951, David Laine, secretary of the American Die Casting Institute, stated that government regulations are almost the sole determinant of the future of the die casting industry, and that many small die casters will be severely hurt by the last quarter of 1951, unless some relief is given them. The balance of the industry, he said, would probably do well until early 1952.

Two charts, showing sales of die castings in dollars since 1936, and the end use distribution of zinc die castings sold in 1951, are reproduced here. The following are excerpts from Mr. Laine's address.

"Four years ago, at your 1947 meeting, I stood on this same platform to discuss the market outlook for die castings.

"In 1947 my task of telling you the outlook for zinc die castings was relatively simple. I said we would use as much special high grade zinc as you could supply. Today my job is much tougher for many reasons.

"First, however, let's look at the record. Here is a chart (Figure 1) of sales of die castings since

(Continued on Page 62)

END USE DISTRIBUTION OF ZINC DIE CASTING SALES BY WEIGHT —1950

End Use Group	Per Cent of Total Sales	Estimated Pounds
A—Mining, Construction & Agriculture Machinery & Equipment	.9	3,000,000
B—Transportation — Motor Vehicles (Except Military)	51.0	173,250,000
C—Transportation — Miscellaneous (Except Military)	2.0	7,000,000
D—Industrial & Commercial Machines, Tools & Equipment	7.3	25,000,000
E—Communication Equipment & Electronic Devices	2.7	9,250,000
F—Office Equipment Machines	1.9	6,250,000
G—Plumbing, Heating & Builders' Hardware	6.7	23,000,000
H—Photographic & Optical—Scientific Measuring, Recording, Medical & Control, Laboratory Instruments & Equipment	2.6	8,750,000
K—Timing Devices, Clocks, Time Operated Devices	.9	3,000,000
L—Home Appliances & Equipment	20.9	71,000,000
M—Sporting Goods, Jewelry, Personal Goods, Toys	2.9	9,750,000
N—National Defense	.2	750,000
TOTAL	100.0	340,000,000

NOTE: Job-Shop produced Die Castings only.

Figure 2

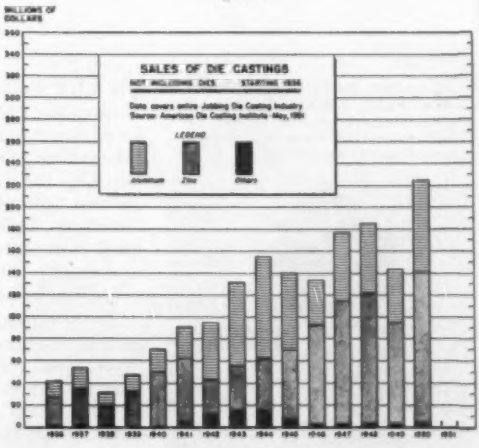
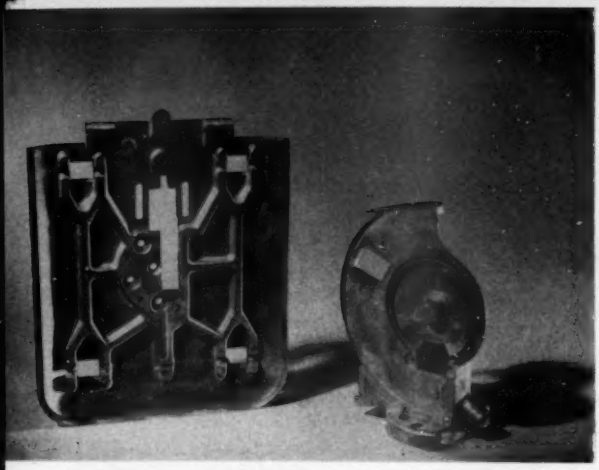


Figure 1

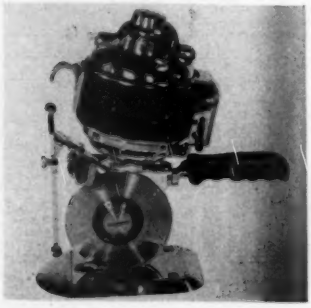


1. TO HOLD A CIRCULAR BLADE and guide it through thick layers of cloth, these two aluminum die castings form a durable standard. The base plate, well reinforced by ribbing, and the blade guard, are typical of lightweight die castings used throughout this line of cloth cutters.

DIE CASTINGS CUT OVERHEAD COSTS

By Minimizing Floor Space Requirements, By Permitting Multiple-Operation Machines, By Standardizing Parts and Assembly.

2. MOST PARTS OF THE FRAMEWORK, including the automatic knife sharpener attached to this circular blade cloth cutter, are produced economically by die casting.



IN THE heart of Manhattan's garment district, an area not economically favorable to metal fabricating operations, H. Maimin Co., Inc., carries on a specialized type of machine manufacturing. This location for its plant is important because within a stone's throw are located a major part of its customers.

The company produces cloth cutting machines and, obviously, finds a real advantage in being close enough to be in direct contact for sales, service and consultation on customers' cutting problems.

The penalty for being so conveniently situated is a limitation of floor space, high rents and labor costs, and restriction on floor loads for machine tools. Only by the extensive use of die castings for major parts of its hundred or more models has the Maimin engineering department been able to solve the manufacturing and cost problems.

For example, the initial accuracy of the die cast aluminum parts makes possible the use of multiple operation machine tools in place of single-purpose machines for drilling, milling, bor-

ing, etc. A Warner & Swasey turret lathe with six tools consolidates operations, reduces floor loads and saves precious space. This is typical of the high-efficiency set-ups used.

These cloth cutters are produced in two general types, one having a circular blade and the other with a straight, reciprocating blade. The type of cloth or other material, the thickness of the pile to be cut (known in the trade as a lay) and the character of pattern to be cut (whether composed of straight or curved lines) determines the choice of cutter and the specific model. Hence, more than a hundred models are needed to meet every special cutting problem.

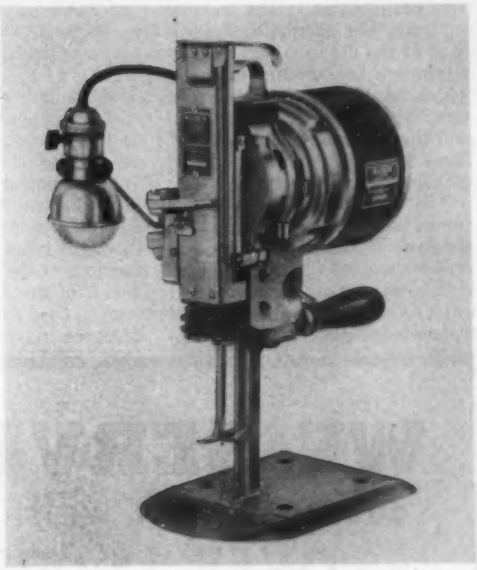
The use of aluminum die castings throughout the entire line not only gives the production advantages previously mentioned, but also results in a highly desirable combination of lightness and durability. To the cloth cutting operator, every ounce trimmed from the cutting machine is that much less weight to be lifted, pushed or carried.

Many die cast members are used for different models simply by variations in machining. The accuracy of dimensions possible by die casting also permits interchangeability of parts, which is desirable for servicing.

An examination of the several photographs accompanying this discussion will reveal the general types of die cast parts used in the cloth cutters, although only a few of the many die castings can be included here.

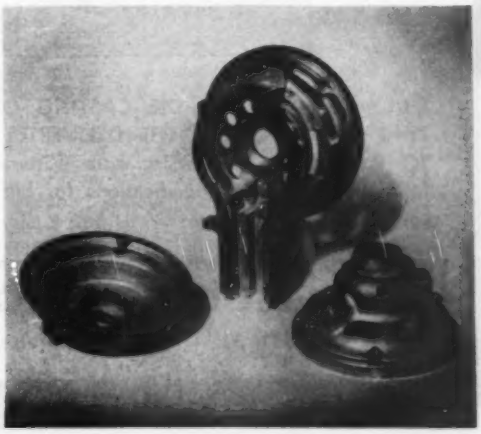
Since all of these cutters are motor-driven, die castings are universally specified for motor end bells. However, in addition to supporting the motor, these parts perform some additional functions.

The front housing of the straight knife models, for example, not only incorporates the end frame for the electric motor but is also the housing for crosshead and gibs. It is true that some machining is necessary to remove draft allowances and to align shaft centers or estab-



3. FOR SOME CUTTING JOBS, a reciprocating straight blade is more suitable. The cutter shown above, like those which have circular blades, is mounted and housed almost entirely in die cast aluminum.

4. MOTOR END FRAMES that also house the crosshead and gibs for the straight knife cutters are die cast because of their complex shape. Accurate alignment is easily obtained on thes. die castings.



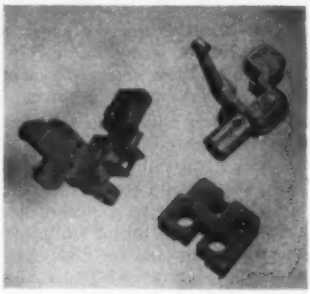
lish parallelism among related surfaces, but the natural accuracy of the die cast part usually minimizes the amount of metal which needs to be removed. The small amount of stock removal and the accuracy of as-cast surfaces favor the more rapid and efficient machine setups.

The standards used for the round knife cloth cutters are similarly designed to serve several structural functions. These standards support the motor and knife, accommodate the geared transmission and provide mounting holes for handle and automatic knife sharpener which is a special feature of Maimin cutters.

In a number of places, the die caster has been able to cut down on tooling costs by using some of the tricks of good die design. Where ventilation slots are to be located along the side of a part, the die caster has produced the through holes by overlapping portions of the cover and ejector halves of the die, thus eliminating the need for expensive slides or cores moving in a direction other than that of the die opening.

Another type of part commonly produced by die casting is the complex internal element used for mounting and aligning functioning members. Two such parts are illustrated, the upper and lower gear blocks for the automatic sharpening apparatus on straight knife machines.

These parts are characterized by the large amount of detail required in several planes, with a need also for relatively high initial accuracy. Many small holes



5. UPPER AND LOWER GEAR BLOCKS offer a special example of structural elements cast to close dimensions with intricate shapes. Even a casual examination will reveal the great amount of machining necessary to produce these from the solid or from a rough casting.

are cored and are held to close center distances despite the fact that some are formed by moving cores rather than by a solid part of the die. Even the critical shaft holes for the gear shafts require only the lightest machining to remove draft and need no cutting at all for location.

Baseplates are also produced by die casting. Almost no secondary operations are needed by these parts which serve to balance and support the cloth cutter and also to slide under the cloth being cut. It would be impossible to incorporate as many features into the base plate by any other fabricating process except at the cost of numerous separate forming and assembling operations.

Slots in which the roller shafts ride are formed as an integral part of the base, and small diameter cross holes which

(Continued on Page 58)

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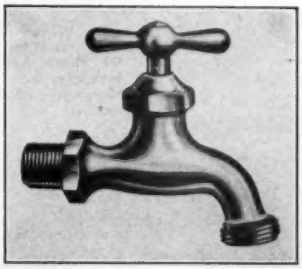

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THIS SAFETY MANUAL prepared specially for die casters is available from the American Die Casting Institute, 366 Madison Ave., New York 17, N. Y. Price is $5.00.

SAFETY MANUAL FOR DIE CASTERS

THE FIRST safety manual for the die casting industry contains a study of safety practices and procedures designed to aid the management of any die casting plant, large or small, in setting up a workable safety program. The manual was prepared under the auspices of the Safety Committee of the American Die Casting Institute, Inc.

The first section of the manual is devoted to those aspects of a safety program that are applicable to the entire plant. Recommendations are made as to industrial hygiene, housekeeping in the plant, records and reports, medical facilities, inspection and enforcement, safety education and the responsibilities of management and the employees.

The remainder of the manual is devoted to special safety practices and equipment necessary in each department. Each department of the plant is treated separately, from receiving, handling and storage to final inspection and shipping. Alloying and casting are covered, together with sections on the various types of machinery and equipment found in finishing departments. Sections are included on the die shop, plant protection and engineering and office personnel.

Of special interest to operators of die casting equipment is the section on casting. A list of the safety clothing and equipment necessary for the operator, along with desirable safety features for the machine. Many precautions in the actual operation of the machine are given, together with safety procedures to be observed during set-up and repair. The list of rules for personnel either working in, or passing through, the casting department is designed to make the department as safe as possible.

The manual also contains an

(Continued on Page 58)

COMPLEX SAND CORE ELI

PRODUCTION SCHEDULES COMPARED

Not only by reducing the *number* of machining operations, but by changing the *character* of these operations, have the die cast fan housings been able to cut production costs. For example, in the following outline of production schedules, notice that the cast iron housing required work on two five-station turret lathes and called for seven drill presses to drill 23 holes. The die cast unit requires only one boring and three drill press setups.

CAST IRON FAN HOUSING

1. Snag and clean.
2. Normalize.
3. Sand blast.
4. Grind name plate face.
5. Face metering pump flange to clean up square.
6. Perform total of 13 rough boring, finish boring, facing and chamfering operations using a P&J automatic turret lathe with five positions.
7. Perform 11 operations including rough boring, finish boring, rough facing, finish facing, chamfering, reaming, rough turning and finish turning with a P&J automatic turret lathe having five positions.
8. Drill 4 motor mounting holes with multiple spindle drill press.
9. Drill 4 pump mounting holes with multiple spindle drill press.
10. Face mill flange on a Milwaukee horizontal mill.
11. Mill base on horizontal mill.
12. Drill 2 holes in the base with two-spindle press.
13. Drill 7 holes with multiple spindle drill press having two positions.
14. Drill 2 holes and tap one hole with a multiple spindle drill press operating at tapping speed.
15. Burr oil well hole with Bridgeport mill.
16. Drill 2 holes with single spindle press.
17. Drill and tap two holes for nameplate.
18. Tap 11 holes.
19. Snag windows.

DIE CAST ALUMINUM ASSEMBLY

1. Assemble 2 brass inserts into die cast flange and flare the ends on an arbor press.
2. Burr 4 holes in the fan housing on the bench and sand the base of the flange flat.
3. Rivet flange to half of fan housing using 4 rivets with Tomkins-Johnson riveter.
4. Sand open side of fan housing and file on bench; sand open side of mating half fan housing and fit two halves together.
5. Place assembly in fixture and drill 7 radial holes for rivets.
6. Wash in sets.
7. Apply putty to seam and rivet with a Judson Thomson riveter.
8. Drill and countersink 6 holes.
9. Rivet using 5 rivets.
10. Buff seam flush.
11. Bore, face and chamfer from 2 sides with Bore-Matic.
12. Tap 3 holes.

1. DUE TO THE COMPLEX SAND CORE which would be required to sand cast this blower housing, the total piece cost of the three die castings is lower than for a single sand casting.

DIE CASTINGS

MINATED BY DIE CASTING

By
H. E. EARL and G. R. WOLTER
Williams Oil-O-Matic Division
Eureka Williams Corp.

DURING the early stages of development of the Williams Oil-O-Matic oil burner Model 5010, a basic design requirement was established to make use of aluminum die castings for the production of the blower housing.

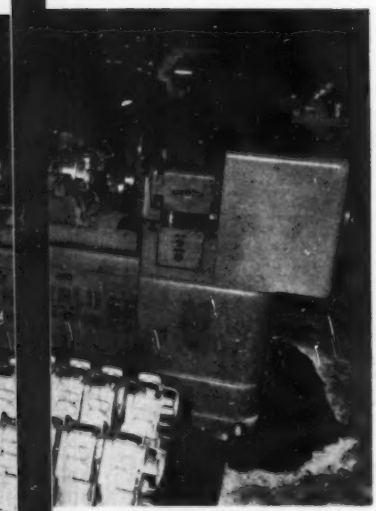
From past experience, it was obvious that material cost reductions could be accomplished by eliminating the previously used castings produced by the use of a rather complex sand core. In addition, savings would be gained by the reduced production tooling required, elimination of operations previously needed for locating purposes and increased production rates obtainable as a result of minimum material removal during machining processes.

Very marked improvement in appearance of the product was obtained due to the smooth metal surfaces inherent in the die cast parts. The surfaces obtainable allowed the use of high gloss baked enamel for the final finish of the unit.

In contrast, the die cast blower assembly, Figure 1, represents a simplification of tooling. It might be thought that an assembly of three parts in which the cumulative tolerances must be held within close limits, especially those of alignment and parallelism affecting the mounting of the motor assembly in relation to the fuel unit, would require extensive machining of the mating surfaces.

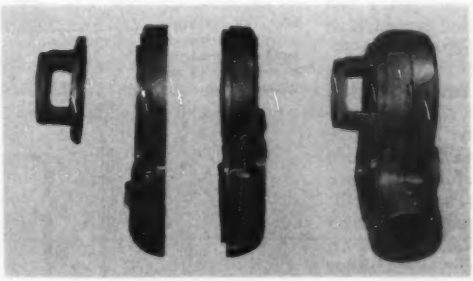
This is not the case! The three die castings are assembled without any metal removal other than normal flash trimming, and the tolerances are held close enough that all machining for alignment and parallelism among the three die castings can be accomplished on a single machine.

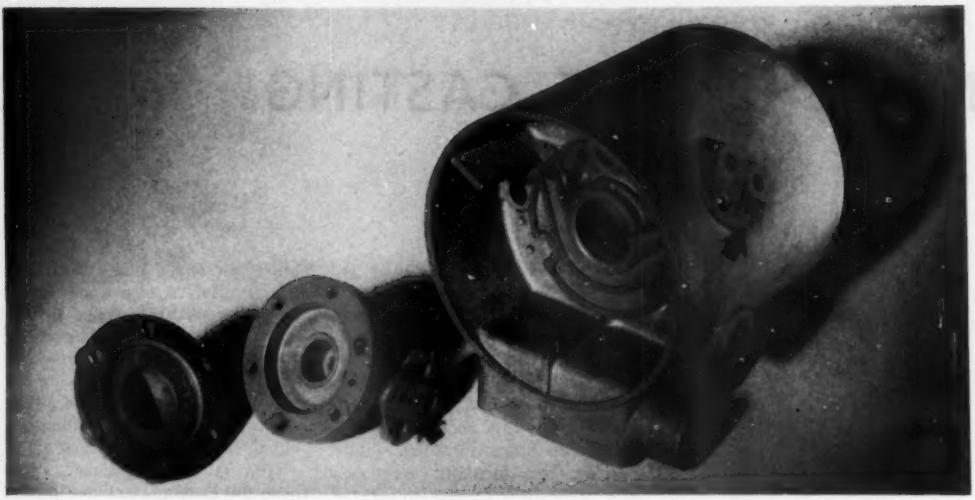
This operation, shown in Figure 2, is performed on a Heald Bore-Matic with two boring heads. A single transversing fixture carries the assembled blower housing between the boring heads to bore, face and chamfer both sides. The use of



2. ONLY THIS ONE BORING MACHINE is required to bore, face and chamfer both sides of the die cast assembly. Initial accuracy of the die castings makes it possible to accomplish these operations in a two-station Bore-Matic with traversing fixtures. This, plus a radial drilling operation, are the only two major machining operations required after assembling the die castings.

3. EXPLODED VIEW shows the three die castings in relative position. Just a bench sanding to remove flash is needed before assembling; mating surfaces are cast to slip-fit tolerances.





4. ATTEMPTS TO DRILL PASSAGES for oil and air through solid portions of this die cast zinc fuel housing and valve failed because of porosity encountered in drilling. Now the die caster accomplishes the difficult job of coring these small, accurately sized and spaced holes indicated by arrows. Big problem is the burning or bending of cores under pressure of hot molten metal during casting.

one fixture and a two-stage machining operation helps to maintain close dimensional control which is essential for quiet operation and elimination of excessive wear which would result from misalignment.

The three die cast parts, shown in exploded view in Figure 3, are attached by means of rivets. The flange die casting is first joined to one half of the die cast housing by means of five rivets, and then the two blower housing halves are fitted together. The die cast halves are formed with lapped edges which provide a tight joint.

Approximate over-all dimensions of the die cast halves are 12" x 10½" x 2¼" with wall thickness averaging between 1/16" and ⅛". It is interesting to note that the die caster has been able to produce parts which are accurate enough to go together with a slip fit.

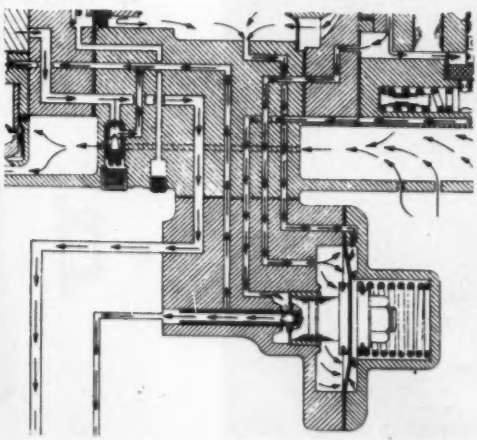
In production, the lap joint is sealed all around with an automotive type putty. The entire assembly is placed in a fixture and seven holes for rivets are drilled by single spindle drillheads mounted radially around the fixture. Rivets, rather than screws, are used for assembling, because the provision of bosses to receive the screws would project into the fan chamber and thereby cause decreased fan performance due to created turbulence.

After riveting, the fan housing is buffed smooth along the seam, and after final assembly when the unit receives a coating of metallic, hammer-type enamel, the joint is completely invisible.

The entire blower and oil burner unit is painted at one time after assembly, Figure 6. The conveyorized unit is sprayed manually and then rises to an overhead baking oven where it reaches a temperature of 185°F. Total baking cycle requires about 20 minutes.

Because of its high strength-weight ratio, aluminum gives a lightweight rigid housing with relatively thin wall sections. The use of the die casting proc-

(Continued on Page 57)



5. SMALL PASSAGES ARE INDICATED in the part of a section view reproduced, *right*. It is difficult to see how this intricate series of channels could be produced at a low cost by any other method.

FINISHING DIE CASTINGS

A SECTION DEVOTED TO THE FINISHING PROCESSES

MACHINING—Most die castings require some machining operations. In this section will be found information to aid in planning and selecting the proper method and equipment for these operations.

ASSEMBLING—Die castings are generally assembled components. This section includes information on fastenings and methods for mass production assembly operations.

SURFACE FINISHING—Most die castings receive some type of surface finish such as plating, organic coating, anodic coating or chemical coating. This section contains information on the methods, processes and equipment used for the various surface treatments on the die casting alloys.

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1 Time is not lost in making set-up wheels. Formerly the operators were given 2 hours a day for making their set-up wheels.

2 One backstand belt will outlast 4 to 5 set-up wheels for this application.

3 Belts maintain a flat surface for the grinding and polishing operation, whereas set-up wheels became rounded and needed dressing from time to time.

4 The uniform grit on the belts gives a much better finish on the tubes than did the rolled-on grit of the set-up wheels.

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PRODUCTION CLINIC
for finishing die castings

A monthly digest of current technical progress selected and prepared by the editorial staff of DIE CASTINGS. This section is devoted to finishing processes for all types of die castings, and is written specifically for the benefit of the production man.

WET BLASTING PREPARES ALUMINUM SURFACE FOR CHROME PLATE

IN SURVEYING potential materials for any design project, the engineer frequently fails to discover any single material possessing the exact combination of properties needed. Where he finds adequate strength he may also encounter excessive weight; if he obtains a good bearing surface he may, at the same time, get an unsatisfactory structural material, etc.

In short, he is usually forced to accept some alternative: he may work out a compromise to accept less than ideal specifications, he may develop a workable combination of materials, or he may discover a method of processing to give the materials at hand the additional properties he is seeking.

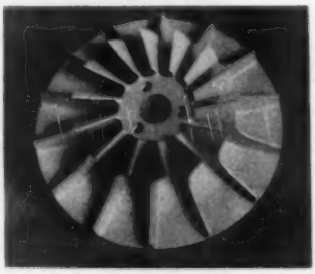
For this reason, unusual interest is being shown in a recently developed method for applying chrome plate directly over aluminum, whether die cast or formed by some other method. In this manner, two highly useful materials are combined to give a set of improved properties.

To the inherent lightness, excellent heat transfer and ease of fabrication characteristic of die cast aluminum, have been added the hardness, wear resistance and lubricity of chrome plate.

Developed by Cro-Plate Co., Inc., Hartford, Conn., this process is readily adaptable to the production plating of large quantities of parts or the custom plating of individual pieces.

It is applicable either for the formation of an improved work surface such as a wear surface on aluminum alloy which is normally too soft to withstand abrasive action or for the production of a decorative effect.

SURFACE OF THIS ALUMINUM IMPELLOR has been protected with a chromium plate applied directly over the base metal. Liquid abrasive blasting cleaned the surface and prevented reoxidation while the part was being transferred to the plating bath.

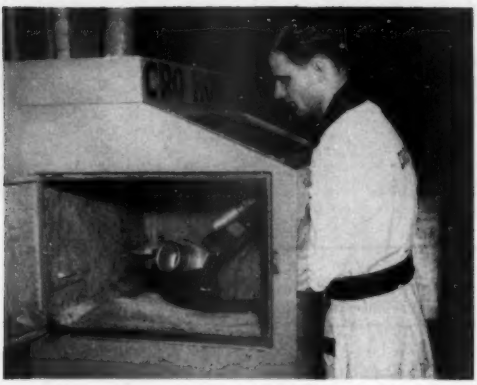


Three unusual aspects of this plating process will influence its potential applications:

1. The chrome plate is applied directly over the aluminum surface without chemical or electrolytic preliminary treatment;
2. Dimensional tolerances can be closely held and the build-up of edges controlled; and
3. High speed deposition permits plating rates considerably in excess of those obtained by conventional plating baths.

The Cro-Plate Company applies this type of finish on a contract basis, but also manufactures the equipment so that other companies may install the process in their own plants. It is, at the present time, being used on a number of products and appears to have wide potential application for other products, as will be discussed later in this article.

The process is simple, requiring only one step before the actual plating operation. Cleaning the surface and preventing formation of an oxide film while the part is being transferred



CLOSEUP OF THE ABRASIVE BLAST unit with one door open shows how parts are handled individually. Unit can also be adapted to production quantities.

from the cleaning to the plating bath are accomplished in a single process.

By wet blasting the surface with extremely fine silica abrasive, all dirt, grease, foreign matter and oxide film are mechanically removed and the part is left with a thin coating of wet abrasive material which insulates it from the air to prevent oxidation.

The abrasive which has been selected is completely inert and therefore does not contaminate the plating bath. Thus, when the part with its protective film is immersed in the plating bath, the abrasive film washes off and settles harmlessly to the bottom of the tank. The abrasive film has thus served its purpose of maintaining a mechanically and chemically clean aluminum surface ready for the plating. The abrasive sludge can be shoveled from the tank periodically without difficulty.

Two compact pieces of equipment are built by the Cro-Plate Company for this process. These are the Cro-Hone unit used for the blasting operation, and a special plating unit. Obviously, the two pieces of equipment need to be placed so that parts being processed can be transferred from one to the other with minimum delay.

A special high speed plating bath is used which deposits chromium at rates as high as 0.006 per hour. This offers an obvious advantage where production runs are concerned.

A few important characteristics of the plate are mentioned here as an aid to product designers seeking specific engineering objectives by the use of aluminum die castings.

Adherence. The chromium plate exhibits a close bond with the base metal. Empirical testing reveals that sufficient force to break the casting does not loosen the chromium layer from the base metal along the edges of the fracture.

Impact Resistance. The impact value of plated aluminum alloy is close to that of unplated mild steel. Again, on the basis of empirical testing, the plate is not loosened when it is hammered sufficiently to deform the base metal.

Bearing Qualities. The low coefficient of friction of chrome plate provides a wear-resistant surface.

Dimensional Control. Company engineers claim to hold dimensions as close as 0.00002. The process was developed originally for the chrome plating of plugs and gages and the technique has been refined to the point where finish dimensions can be obtained without the conventional cycle of grinding undersize, plating oversize and lapping to finish dimension.

Build-up of edges is controlled and auxiliary anodes are used to throw into recesses or inside hollow shapes.

A few typical die cast aluminum parts now being chrome plated by this process are shown in accompanying illustrations. One of these is a special impeller with complex shape.

(Continued on Page 52)

TEST RUN plating of an aluminum impellor is used to determine proper cycle before being set up on a production basis.

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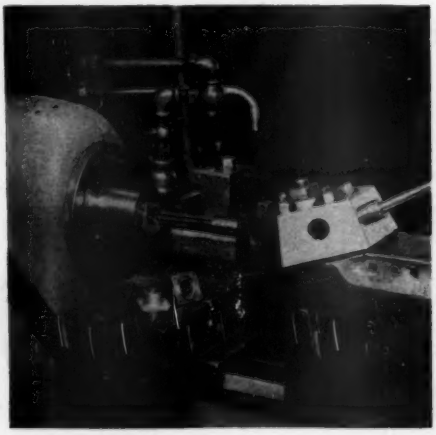
A Production Line Report:

Machining And Finishing Microphone Die Castings

By T. G. MITCHELL
Plant Superintendent
Electro-Voice, Inc.

Designers and production men of Electro-Voice, Inc., Buchanan, Mich., are accustomed to thinking in terms of die castings, as is evident by a study of the microphones and related equipment that this company manufactures. Nearly all units include one or more die castings produced in zinc alloy. Much machining of die castings is done in this plant. A few setups having points of interest are here described.



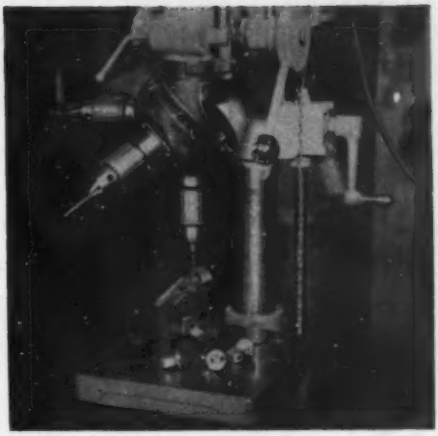
DAMPING CHAMBERS for dynamic microphone heads are simple flanged die castings and undergo initial machining in the Elgin hand screw machine setup, Figure 1. Each casting is loaded into the spindle collet by hand, the collet gripping the hub diameter with the flange overhanging. Flange facing is done first, using a bit of high speed steel in the rear tool holder on the crosslide, which is fed forward by the hand lever at left in Figure 1.

Only two turret tools are needed. The first of these is a high speed steel bit that bores a short step diameter in the cored central hole when the turret is advanced to a stop that determines the axial depth of the step. When the turret retracts, it is indexed 180 deg. to bring a reamer in line with the hub hole and then is advanced by hand to ream the remainder of this hole. Although only hand feeds are employed, 150 castings an hour are machined in this setup.

DIE CASTINGS shown in Figure 2, though termed "studs," include a circular disc-like base having short cast external thread. This base supports a second disc whose faces are at right angles to the base. The parting plane of this casting is through the axis of the base and half way between the faces of the supported disc. No holes are cored in the parting plane and, as three such holes are required in this plane, two being at right angles to the base, all three are drilled. The third hole is at an odd angle passing through the supported disc and into the base where it meets one of the base holes.

Drilling is done in the somewhat box-like fixture shown after the casting is set into a rear recess and is locked by a sliding clip, the base being at the top and horizontal in the position shown. Three base holes, all of different sizes, are drilled through bushings that are a part of the fixture. These drills are held in three chucks of a Quadrill head and are brought successively into vertical drilling position. The two larger holes are in the parting plane and the third is 3/8 inch to the side of this plane.

For drilling the angular hole, the fixture is inverted and rested on the sloping face that appears on the upper side of the fixture in Figure 2. This brings a fourth drill bushing into vertical position and it guides the drill that produces the angular hole.



BECAUSE ZINC ALLOY IS QUITE MALLEABLE, lips of castings can be spun or rolled over to fasten castings to mating parts. This is done in fastening the circular cap, Figure 3, with its coaxial cable, into the recess of a boss of the die casting to which the cap is applied. When the cap is in place, the casting is set in a fixture under the spinning tool in a drill press. This tool turns at about 300 rpm and has three rollers that apply pressure as they roll on the metal and spin it inwardly about 0.030 inch to lock the cap in the recess.

UNTIL RECENTLY, many of the die castings had to be deburred by hand following flash removal. Considerable reduction in the man-hours that went into deburring has now been effected by the application of Wheelabrator Tumblast machine, Figure 4. This machine has been especially rigged to employ granulated apricot pits instead of sand or shot, as the action of these on the die castings is too severe. Modifications of the machine included increasing the rotational speed of the blast wheel (and consequently the velocity of the stream of apricot granules) and in enlarging the holes in the rubber belt that supports and tumbles the die castings. The higher velocity of the abrasive compensates for its lighter weight and the larger belt holes keep the light abrasive feeding through the belt more rapidly as tumbling and blasting proceed.

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The Tap-Lok Insert eliminates the uncertainties, losses and weaknesses of molded-in and cast-in inserts — improves the product at lower costs.

U. S. Patent 2,455,095

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BURMAN, ALLEN ADVANCED BY CRO-PLATE

Theodore L. Brantley, Jr., president of the Cro-Plate Co., Inc., Hartford, Conn., has announced the appointment of Robert C. Allen as treasurer and Allan R. Burman as vice-president.

Mr. Allen, a certified public accountant, is a graduate of American International College

Allan R. Burman

and holder of a master of science in business administration from Boston University. Mr. Burman is a former advertising account executive and will be in charge of advertising and sales for the new company.

The Cro-Plate Co., Inc., is an industrial chrome plating organization and also manufactures metal plating and finishing equipment.

SYMPOSIUM ON FINISHING DIE CASTINGS

A symposium on "Finishing and Plating of Die Castings" will be included in the agenda of the Buffalo Convention of the American Electroplater's Society at the Statler Hotel. The convention will begin Monday, July 30, 1951, and will have for its keynote speaker that morning Dr. William Blum of the National Bureau of Standards.

Topics scheduled for discussion include "Some Engineering Aspects of Plating Room Operation," "Substitute Finishes," "Plating Control" and "A. E. S. Research." In addition to the technical sessions, a ladies' program has been planned and entertainment for all those attending has been scheduled.

Further information on the program and applications for housing accommodations may be obtained from the Society's headquarters, Box 168, Jenkintown, Pa.

COWLES APPOINTS WOLEBEN

The Cowles Chemical Co., Cleveland, has announced the appointment of George R. Woleben as technical sales and service man for the company's Metal Cleaner Dept. in New York State.

George R. Woleben

ENAMEL FILL Your Die-Cast Parts

In Color With Lettering and Design

5 TIMES FASTER Than Hand Filling

The Acroprinter illustrated shows only one type of machine we build for color filling of lettering and design with enamel. Send samples of parts you wish to fill for estimates.

The ACROMARK Company

426 Morrell St., Elizabeth 4, N. J.
"The Original Marking Specialists"

Circle No. 18 on Reader Service Card for more information.

New Improved Service Facilities For STEVENS CUSTOMERS

This modern, well-lighted workroom is Stevens' new experimental polishing and buffing laboratory . . . developed and expanded to serve the needs of metal finishers.

For years the Stevens organization has concentrated on bringing better polishing and buffing methods to users of Stevens compositions. To provide this service, Stevens has maintained facilities for finding quick, practical answers to customers' production problems. Our new installation—featuring all new machines and highly experienced technicians—working with our composition laboratory—enables us to extend this service far above and beyond previous efforts.

Let us help you find new polishing and buffing profits with Stevens methods and materials. Our staff can show you many ways to cut costs *and* improve your finished product—without obligation. Either call on your nearby Stevens representative or write direct to Frederic B. Stevens, Inc., Detroit 16, Michigan.

METAL FINISHING EQUIPMENT AND SUPPLIES SINCE 1883

FREDERIC B. **STEVENS** INCORPORATED

DETROIT 16, MICHIGAN

Circle No. 131 on Reader Service Card for more information.

USEFUL LITERATURE

For additional information on the products appearing on this and the following pages, mark the key number of the item on the card bound into this issue. Drop card in the mail—no postage is required.

170 CLEANS AND PHOSPHATES ALUMINUM:

A non-toxic, non-corrosive compound called Phoscote that cleans and phosphate-coats aluminum parts in one operation is described in a technical bulletin offered by the Perlon Corp.

171 STANDARD PRODUCTION TOOLS:

11 catalog bulletins are available from the Scully-Jones Co. which give specifications and prices on the following standard company production tools: drill and tap chucks, arbors and adapters, quick change chucks, tap holders and drivers, counterbores, countersinks and tap drills, adjustable adapters, sleeves and sockets, floating holders, centers, recessing tools and work rest blades.

172 ENAMEL STICKS TO ALUMINUM:

Neolac 600, an enamel which will air dry to handle in 2 hours, is described in literature offered by the U. S. Stoneware Co. According to the Company, the finish adheres firmly even to polished aluminum.

173 DETAILS ON PUNCH PRESSES:

Complete details on punch presses in 12 models from six to 80 tons in capacity are contained in a catalog offered by the L & J Press Corp.

174 EQUIPMENT FOR CORROSIVE LIQUIDS:

Pumps and heat exchangers manufactured by Nukem Products Corp. for use with corrosive liquids are described in literature available from the company. These products are non-metallic, being constructed of cast resins.

175 BRIGHT STABILIZED ZINC FINISHING:

Zinc plate, when stabilized to prevent white corrosion, can be used as a substitute for chrome plating on die castings, according to the Promat Div., Poor & Co. A company folder describes Promat products for zinc plating.

176 TUMBLING BARREL SPECIFICATIONS:

Complete specifications of six tumbling barrels with constant or variable speeds are given in literature offered by the D. J. Murray Mfg. Company.

177 CATALOG AND CODE BOOK:

A special catalog of those company items which will be in greatest supply has been issued by Severance Tool Industries, Inc. A special code for economy in telegraphing the company is included on the back cover. The company manufactures mills, cutters, reamers, countersinks and associated products.

178 CHICAGO PLATING FACILITIES:

A survey of the facilities, including floor space, equipment, solutions, employes and amperage capacity, available for defense work has been compiled by the Chicago Electro-Platers Institute from its member organizations. It is available to government agencies, prime and sub-contractors and others concerned with defense production.

179 ONE-OPERATION CLEANING METHODS:

Heavy-duty metal cleaning with compounds manufactured by the Cowles Chemical Co. is discussed in a booklet published by the company. A section is devoted to soil removal from zinc die castings.

180 MASKS AND STENCILS:

Free samples and literature on masks for abrasive blasting, painting and protection of surfaces are available from the Gleicher Mfg. Corp. The company makes masks and stencils from all brands of pressure-sensitive tapes.

181 PROTECTION FOR TAPPED HOLES:

Design data on helical-wire thread inserts and the use of these inserts in the protection and repair of tapped holes is offered by the Heli-Coil Corp. in a 16-page bulletin. Detail drawings and text explain how these inserts are used as original manufacturing components or production salvage operations. Nine pages of tabular data give all specifications for various metals.

182 SEALING OFF POROSITY:

The elimination of porosity in die castings and other types of castings through the use of the Mogul Cast-Seal Impregnating Process is explained in an 8-page booklet available from the Metallizing Co. of America.

183 DOUBLES ABRASIVE BELT LIFE:

Information on a new type of contact wheel that is said in some cases to double abrasive belt life is offered by the Carborundum Co. Called the "61" wheel, it is a specially-serrated rubber wheel that causes a controlled breakdown in the bond of the abrasive belt.

184 ROTARY WORK FEED TABLE:

A compact, complete rotary work feed table is described and illustrated in Bulletin T-80, published by the Bellows Co. Dimension drawings, wiring diagrams and specifications on this air-powered device are included.

185 VACUUM CALCULATOR:

A cardboard slide rule for calculating the capacities of Stokes vacuum pumps and other data needed in vacuum research and processing work is offered by the F. J. Stokes Machine Co.

News about UNICHROME Trade Mark

COATINGS for METALS

METALLIC ORGANIC DECORATIVE PROTECTIVE

A black dip for zinc that's glossy and uniform

Make use of your plating equipment to get a metallic finish that looks as good as black enamel. This new Unichrome Dip for zinc plate has good gloss, uniformly dense blackness; and increases the corrosion resistance of the zinc.

Extra corrosion resistance for "raw" zinc die castings

Defense order specifications on chromate treating are easily and economically met with Unichrome Dips. Producing an iridescent yellow or olive drab finish, they provide excellent corrosion protection and dense, uniform color. The processes are fast, easily controlled.

Electrolytically-produced conversion coating speeds parts for defense

Like anodizing, the Anozinc* process for zinc plate uses current to form a tougher and more corrosion resistant finish. It dovetails with the zinc plating set-up, permitting fast, continuous processing of such parts as shell casings, die castings and propeller blades.

*Trade Mark

Unbeatable primer for aluminum and magnesium

In test after test made by outside concerns, Unichrome Primer AP-10 has come through as the one which affords greatest protection to light metals and increases durability of top coats. It adheres through weathering, salt and fresh water immersion without blistering, undercutting or cracking, and is highly recommended by well known producers of aluminum and magnesium for use prior to painting or enameling.

What to do today for a BRIGHT FINISH

A little zinc goes a long way in bright finishing

A bright finish that looks like chromium is easily obtained by zinc-plating die castings and then processing them in Unichrome Clear Dip. You don't need much of a zinc deposit either. A supply-stretching .0003" of plate is ample. Thus, pound for pound, you can plate *more* products than with other finishes, and save money besides.

The Unichrome Dip Finish resists corrosion, stays bright. It has been used for several years on ice skates, bicycle parts, and refrigerator shelves. A still higher quality finish will be assured by applying a clear protective coating such as Unichrome Coating B-115 over the Clear Dip Finish for extra protection.

A chemical treatment, the Unichrome Dip Process produces its finish integral with the zinc in 5 to 20 seconds. The solution is easily controlled and adapted for a long use in manual or automatic equipment.

HOW TO CONTINUE CHROMIUM PLATING OF ZINC DIE CASTINGS

If you can't use copper and nickel, you can plate chromium directly on zinc die castings. When plated directly on zinc die castings, the chromium is usually gray and dull, but brightness can be brought up by buffing. You'll find direct chromium plating a practical operation on simple, easy-to-buff shapes—especially with Unichrome S.R.H.S. Chromium Solution which plates brighter on castings than ordinary chromium baths.

A deposit thicker than usual is required to avoid buffing through to the base metal. And baking on of Unichrome Coating B-115 is highly recommended for extra protection against dulling in service.

UNICHROME Trade Mark

UNITED CHROMIUM, INCORPORATED

100 East 42nd St., New York 17, N. Y.
Detroit 20, Mich. • Waterbury 20, Conn.
Chicago 4, Ill. • Los Angeles 13, Calif.
In Canada:
United Chromium Limited, Toronto, Ont.

Circle No. 132 on Reader Service Card for more information.

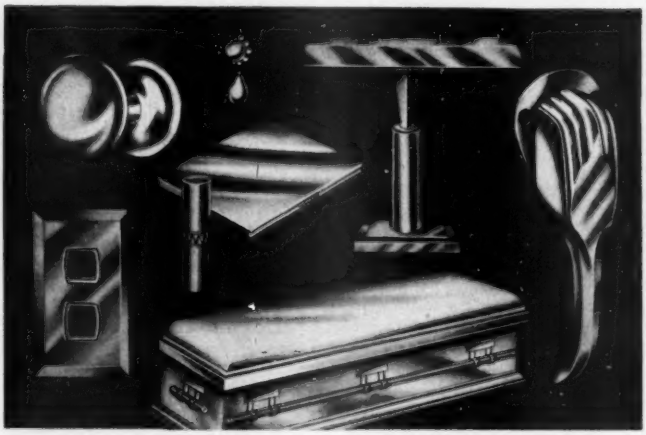
SET UP INFORMATION CENTER FOR DEFENSE PRODUCTION

To provide information on defense production to business representatives in the Washington area, two top defense agencies today announced plans to establish jointly a Defense Production Inquiry Center.

The National Production Authority, U. S. Department of Commerce, and the Defense Production Administration will put the new information center into operation about May 1 in the main lobby of the old GAO Building, Fifth and G Streets, N. W.

The new Inquiry Center is not intended to encourage businessmen to come to Washington with defense production problems, officials emphasized. It is designed to assist individual business men, or their representatives in Washington, by providing a central place to get quick answers to their questions. Businessmen in other areas will continue to get information from field offices of the Department of Commerce.

The Inquiry Center will be staffed by persons who have either specialized industrial background or governmental experience in particular fields. They will be familiar with all phases of a particular industry's problems. They will either furnish information to business representatives or arrange appointments with NPA or DPA operating officials who can supply particularized data.



NOW... simulate copper, brass and bronze on products like these with M & W PLATELUSTRE

Don't let critical metals put a *needless* crimp in your production!

Take zinc or steel—apply a coating of one of the new PLATELUSTRE finishes. You wind up with products and parts that look so much like copper, brass and bronze that *the eye can scarcely tell the difference!*

Whether you have been using now unavailable copper and its alloys for *making* products or for *plating* products, you will find these new M & W finishes *equally* effective in keeping your plant running. There are types for air-drying and baking schedules—pick the one that best fits *your* production requirements.

Let an M & W Technical Service Engineer show you—*right in your own plant*—how easy these PLATELUSTRE coatings are to use, and what striking effects they produce. Or, if you prefer, write for free literature.

PIONEERS IN PROTECTION

MAAS & WALDSTEIN CO.

MID-WEST DIV. - 1650 CARROLL AVE., CHICAGO 12, ILLINOIS
PACIFIC COAST DIV. - SMITH-DAVIS CO., 10751 VENICE BLVD., LOS ANGELES 34, CAL.
MANUFACTURERS OF INDUSTRIAL FINISHES

Circle No. 4 on Reader Service Card for more information.

APEX SMELTING DECLINES GOVERNMENT ASSISTANCE OFFER

The Apex Smelting Co., Chicago and Cleveland, a non-integrated aluminum alloy manufacturer, has announced that it has decided not to participate in the government's current primary aluminum expansion program. The decision was caused, according to the company, by inability to reach a mutually satisfactory agreement with the government.

The company statement said that although the pressing need for non-integrated primary aluminum producers who could supply the requirements of independent foundries and fabricators is recognized by the Apex management, the accelerated amortization assistance offered by the government would still leave the company in an adverse competitive position under present laws and policies. The accelerated amortization program, according to the company, is designed more to aid newcomers, whose major problem is the abnormally high construction cost of new facilities.

The company emphasized that while it would not expand at present, data on all phases of primary aluminum production has been gathered to enable Apex to enter an aluminum expansion program immediately at any time the situation makes it feasible.

FRED C. BOYCE RE-ELECTED AS D. J. MURRAY HEAD

Fred C. Boyce was re-elected president of the D. J. Murray Manufacturing Company, Wausau, Wisc., to serve his eighteenth consecutive year as president of that company by the board of directors following the stockholders' meeting in May.

Other officers elected were A. W. Plier, executive vice-president and general manager; M. P. McCullough, Chicago, and D. C. Everest, vice-presidents; C. L. Durkee, vice-president and sales manager; George L. Ruder, treasurer; W. A. Marquardt, secretary. Re-elected as assistant treasurer was Grover Keeth and as assistant secretary, P. W. Hoeper.

At the annual stockholders' meeting Mr. Boyce, Everest and McCullough were re-elected for the thirtieth consecutive year as directors. Other directors re-elected were Mr. Plier, Hoeper, Keeth, Ruder and Durkee.

JOINS N. Y. SALES STAFF

K. B. Hollidge, executive vice-president of The Arthur Colton Company, Division of Snyder Tool & Engineering Company, 3400 E. Lafayette Avenue, Detroit 7, Mich., has announced the appointment of William F. Schafer as sales engineer with headquarters in the company's New York office, 303 Fifth Avenue.

PROMOTED BY DIVERSEY

H. B. Conrad, formerly assistant to the manager of the Diversey Corp.'s southwestern division at Kansas City, has been promoted to manager, according to W. E. Noyes, vice president in charge of the company's sales.

The Cleveland Ordnance District figures that 95 million of its 181 million worth of defense orders has been spread out among small manufacturers in the Cleveland area.

Unique

Tool-room-built Machine Pays Big Dividends in Hollow Milling and Counter Boring Die Cast "Protek" Plug

To get high production quickly in special machining operations is a problem die casters run into every day. Machining by hand on standard machine tools is too slow, too costly. Expensive, custom-built special purpose machines are often out of the question.

But if you have a tool engineer or designer with imagination, you can build many special purpose machines right in your own tool room, quickly and inexpensively.

The machine shown above was designed by S. J. Biello of Harvil New England Corporation and built in their own tool room. Two standard drill presses, and two Bellows electrically controlled Drill Press Feeds; a dial table and ejection device powered by two Bellows Air Motors, made a machine that was so fast it required two operators to keep pace with it.

Ingenuity and Bellows "Controlled-Air-Power" Devices help thousands of manufacturers get better, faster and safer production in second-operation die cast machining.

Would you like the complete story on this and other die cast machining operations?

Write for Foto Facts File FF47-778 and for a copy of "Faster, Safer, Better Production." Free on request. Address Dept. DC 651, The Bellows Co., Akron 9, Ohio.

The Bellows Co.

ESTAB. SHED 19

AKRON 9, OHIO

Circle No. 3 on Reader Service Card for more information.

NEW PRODUCTS

For additional information on the products appearing on this and the following pages, mark the key number of the item on the card bound into this issue. Drop the card in the mail—no postage is required.

POLISHING HEAD FOR DIE CASTINGS

Portable Brush-Backed Polishing Head
Vonnegut Moulder Corp., Indianapolis, Ind.

SPECIAL FEATURES: Used to polish and smooth die castings and to eliminate flow marks. Will produce a number of finishes by variation of the grade and grit of the abrasive strips used. Brush tips follow irregular surfaces rather than reshaping them.

SPECIFICATIONS: Head consists of a drum holding 16 replaceable brushes and a center spool on which are coiled 16 strips of abrasive cloth. In operation, the brushes force the tips of the cloths into depressions in the work piece and allow them to ride over projections. End plates and central cylinder are made of aluminum. Made in 2" and 4" widths, which weigh 4 and 6 pounds fully loaded. The smaller head is meant for use on portable tools. Head holds approximately 24 feet of coated abrasive when fully loaded.

For additional information circle No. 92 on the Reader Service Card.

MINIATURE POWER SCREWDRIVER

Desoutter Screwdriver and Nutrunner M60.
Newage International, Inc., New York, N. Y.

SPECIAL FEATURES: A reversing, adjustable-torque, automatic power screwdriver that weighs 8 ounces. It is designed to aid in

production line work on delicate mechanisms, such as radio, television and radar sets, cameras, clocks and business machines.

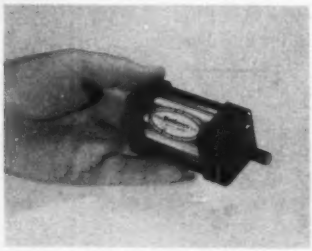
SPECIFICATIONS: Air operated motor runs at 14,000 rpm. Automatic on-off control is actuated by pressure of bit against work. Tension is regulated by setting of pressure reducing valve. All parts are of nickel-chrome-moly steel, heat treated. Ball or roller bearings throughout. Handles all screws from No. 1 to No. 8 ANF and ANC and equivalent nuts. Reversing control built into head of tool. Impact-type clutch can loosen any screw which it has tightened. Lubricated by air-line lubricator. .

For additional information circle No. 93 on the Reader Service Card.

TINY AIR CYLINDER FOR PARTS POSITIONING

Han-D-Air Cylinder
Bellows Co., Akron, Ohio

SPECIAL FEATURES: Unit was designed primarily for jig and fixture operations and for positioning and ejecting parts. It has a power factor of 1:1, developing a thrust approximately equal to the applied air pressure.



SPECIFICATIONS: Bore—1⅛", stroke—1", length—4½", height—1¼", width—1½". ½" thread on end of piston rod. Mounted from front or rear flange, side, foot or front pivot. Brass cylinder, aluminum alloy heads, oil resistant piston cup and heavy spring feature construction.

For additional information circle No. 94 on the Reader Service Card.

BRIGHT COATINGS FOR HARDWARE

Baquik Clear Chrome and Metal Coating X-2534
Metalbond Clear Air Dry Chrome and Metal Coating SL-300
Strathmore Products, Inc., Syracuse 4, N. Y.

SPECIAL FEATURES: Exceeds automotive salt spray standards for chrome plating. Utilizes zinc plating covered with resistant material. Requires no additional equipment other than that available for chrome plating. Cost comparable to, or lower than, copper-nickel-chrome method.

SPECIFICATIONS: SL-300 is an air drying material. X-2534 is a bake finish. In operation, die casting is first zinc plated, the plate chemically treated, bleached and the protective coat applied. General practice is to apply two dip coats and then to spray another coat on visible sections. Both products require special blends of thinners.

For additional information circle No. 95 on the Reader Service card.

DECORATIVE CAP NUT

Speed Nut Hub Cap
Tinnerman Products, Inc.
Cleveland

SPECIAL FEATURES: A decorative hub cap and wheel retainer for light applications such as mobile toys and wheel goods. Replaces hub cap, cotter pin and washer. Can be used on any exposed shaft or stud end for either rotating or stationary assemblies.

SPECIFICATIONS: One piece assembly. No special tools required for application. Six points in cap nut bite into shaft or axle, holding the nut in place. Made of aluminum and available in a number of finishes. Produced in two styles—a "derby" for general use and a "top hat" for greater shaft protrusions.

For additional information circle No. 96 on the Reader Service Card.

GRINDER FOR DIE WORK

Midget Pneumatic Grinder
Mall Tool Co., Chicago

SPECIAL FEATURES: This grinder has been designed to do precision work on small dies in hard-to-get-at places. An arbor runout within .0015 inch helps hold tolerances. Motor is equipped with noise silencer to eliminate high pitched tones.

SPECIFICATIONS: Tool is 4-⅜ inches long, 1-¼ inches wide. Weight is 12 ounces. Housing is aluminum alloy. Choice of lever or button type throttles with special collet guard. Rotary van type air motor develops 26,000 rpm. Built-in speed regulator to stabilize operating speeds. Air exhaust is directed away from operator, where it cleans and cools work. Eight sizes of Erickson collets are available to give range of shank sizes from 1/64 inch to ¼ inch.

For additional information circle No. 97 on the Reader Service Card.

CHROME SUBSTITUTE

MD 769 Aluminum Paste
Metals Disintegrating Co.,
Elizabeth, N. J.

SPECIAL FEATURES: Recommended by the company for automotive type hardware. Its appearance is said to be as near to chrome as is possible to obtain with a metal pigment.

SPECIFICATIONS: MD 769 Aluminum Paste is a leafing type pigment, containing 65 per cent non-volatile content. Screen tests of pigment show 100 per cent through a 325 mesh. When combined with the proper vehicle, mixtures are practically free of agglomerated particles.

For additional information circle No. 98 on the Reader Service card.

Circle No. 11 on Reader Service Card for more information. →

FREE

ASK FOR BOOKLET No. D-6

IF YOU PRODUCE PARTS THAT REQUIRE FINISHING OF ANY KIND

This 22-page booklet is guaranteed to open your eyes! It gives you the inside story of advanced barrel finishing as never told before!

In the last five years, barrel finishing has made rapid advances. Only those directly connected have been able to keep up. Only 30% of the nation's manufacturers are benefiting from the tremendous cost savings and improved finishes made possible by these advances.

Now is the time to investigate this labor-saving, cost-cutting method. ALMCO barrel finishing equipment has completely paid for itself in as little as two months! This is easy to understand. A single unit installation replaces from two to twelve men. Savings run as high as 95%.

"Advance Barrel Finishing" is the only mass deburring, grinding and finishing method where results are controlled. Amazing results are now possible on almost all types of parts from large castings to small intricate parts. Close tolerance parts can be finished with absolute uniformity to almost any desired micro-inch reading.

WRITE TODAY FOR YOUR FREE COPY

ALMCO Supersheen

AMERICA'S LARGEST MANUFACTURER OF ADVANCED BARREL FINISHING EQUIPMENT—MATERIALS AND COMPOUNDS

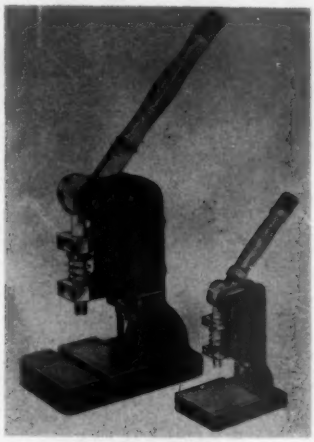
ALBERT LEA, MINNESOTA

SPEEDING LIGHT MANUFACTURING OPERATIONS

Hand Operated Presses

I. H. Bradley & Sons, Bridgeport, Conn.

SPECIAL FEATURES: These presses are designed to take the place of more expensive power operated presses in light manufacturing assembly operations. Both models can be modified for foot operation.



SPECIFICATIONS: Larger press weighs 22 pounds, exerts force of 1250 pounds. Height adjustment of 1½" and stroke of ⅞" permit flexible adjustment. Weighted hardwood handle. Coil spring aids in quick hammer return. T-slot in base for insertion of tools or fixtures. Smaller size is of identical construction, but weighs 6½ pounds, has ½" stroke and 1" adjustment.

For additional information circle No. 99 on Reader Service Card.

SUBMERGED FINISHING BARREL

Model DB-200

Almco Div., Queen Stove Works, Inc.

Albert Lea, Minn.

SPECIAL FEATURES: This barrel is intended for use with large

heavy parts and large soft metal parts. Also can be used for small parts requiring high color and close micro-inch finish.

SPECIFICATIONS: Cushioning effect results from barrel being completely immersed. Impact between large parts is kept to a minimum. Speed adjustable from 6 to 30 rpm. Positive magnetic brake permits inching to position. Cam-operated doors. All-welded steel construction. Available with or without Neoprene lining.

For additional information circle No. 100 on Reader Service Card.

BENCH MODEL WET BLAST UNIT

Cro-Hone, Jr.

Cro-Plate Co., Hartford, Conn.

SPECIAL FEATURES: Unit is a bench model wet-blaster that is designed to give a clean base for plating or painting and to remove

completely all foreign and amorphous substances from metal surfaces. Utilizes fine abrasive suspended in water which is forced through a syphon gun by air pressure.

SPECIFICATIONS: Stainless steel construction. Unit has no moving parts or pumps. All openings are fitted with splash-proof guards. All controls on one side of cabinet. Observation window located in loading door has blower to clear away splash. Removable filter for easy cleaning and changing. Installation requires ⅜" air connection and ½" water connection.

For additional information circle No. 101 on Reader Service Card.

AIDS IN SCRAP HANDLING AND DISPOSAL

Brusco Automatic Self-Dumping Hopper

Brummeler Steel Products Co., Grand Rapids, Mich.

SPECIAL FEATURES: Hopper is placed adjacent to work area and carried to dump by fork lift truck when filled. Release can be

tripped by driver without leaving seat. Load dumps automatically because of center of gravity of loaded hopper. When empty, hopper returns to position.

SPECIFICATIONS: Construction is all welded 3/16" steel plate. Rocker is one-piece cast iron. Skid is heavy angle steel. Capacities from ½ to 2 cubic yards, with special sizes and capacities made to order.

For additional information circle No. 102 on the Reader Service card.

POLISHING TALLOWS FOR BUFFING

Types 5B41, 5B42 and 5B47.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

SPECIAL FEATURES: These three polishing tallows are said to cost less than materials with similar characteristics. They do not contain mineral greases, waxes, oils or other unsaponifiable materials.

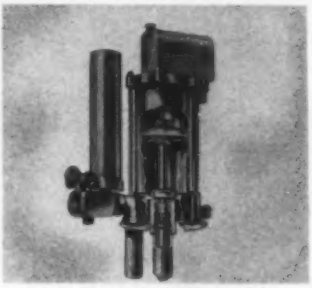
SPECIFICATIONS: All three materials are said to have good saponification characteristics. 5B41 has a medium melting point and 5B42 a high melting point. Good lubrication qualities are claimed for all three products.

For additional information circle No. 103 on the Reader Service card.

PUMPS FOR FINISHING MATERIALS

Type A, B and BS Material Handling Pumps
Binks Mfg. Co., Chicago, Ill.

SPECIAL FEATURES: Operate directly from containers; either open or closed 55 gallon drums or 5 gallon containers. Will handle thinners, enamels, lacquers and paints, and heavy protective coatings of all kinds. When used with Binks' fluid regular, these pumps deliver a steady flow, completely eliminating pulsation.



SPECIFICATIONS: Positive-action, double-acting pump. Uses standard plant air supply. Pumps can be cleaned by pumping solvent through them. Available in five pressure ratios from 1:1 to 10:1.

For additional information circle No. 104 on the Reader Service card.

COMPACT DESIGN TUMBLING BARRELS

Murco Tumbling Barrels
D. J. Murray Mfg. Co., Wausau, Wis.

SPECIAL FEATURES: A compact design barrel with motor and operating mechanism totally enclosed. Controls and magnetic re-

(Continued on Page 53)

To meet MILITARY SPECIFICATIONS

for Cleaning • Rust-Removing • Etching Phosphatizing and General Metal Conditioning of all kinds of Metal Surfaces

Use PREP PRODUCTS!

SPECIFICATION NUMBER	CONFORMING MATERIAL
MIL-C-5541 (see also QPL-5541-1)	Lytanite
MIL-S-5002	Lytanite
MIL-C-10578	
Type 1	Metalprep Nos. 77, 102—Alumiprep No. 1
Type 2	Metalprep Nos. 10, 15—Alumiprep No. 20
JAN-C-490—Grade II	
Type 2	Emulsoprep
Type 4	Metalprep, Prep-Rite-L, Alumiprep, Prep-Rite
Type 5	Metalprep, Alumiprep, Prep-Rite-L, Prepwash
Type 6	Emulsoprep No. 710-E.C.
U.S.A. 3-213	(See MIL-C-10578)
U.S.A. 3-192	Metalprep Nos. 28, 10, 15 Alumiprep No. 20
U.S.A. 46-20007	Metalprep Nos. 10, 15 Alumiprep No. 20 Prep-Rite No. 16
U.S.A. 77-53	(See AN-F-20)
AN-F-20	Lytanite Metalprep Nos. 10, 15, 77, 102 / Alumiprep Nos. 1 and 20 / See MIL-C-10578
AR-E-10	Lytanite
AR-C-170	(See MIL-C-5541)
TAC-ES-431	(See MIL-C-10578)
AXS-1245	(See JAN-C-490, Grade II)
Engineering Corps—T-1184	Metalprep No. 28
U.S.N.—Appendix 6	Metalprep

51-C

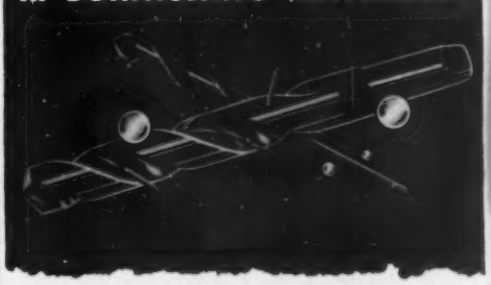
Send for Data Sheet • Advise Govt. Spec. Number

NEILSON CHEMICAL CO.

2602 Tecumseh Rd., Windsor, Ont. — 6963 BENSON ST., DETROIT 7, MICH. — 3411 Union Pacific Ave. Los Angeles 23, Calif.

Circle No. 17 on Reader Service Card.

in BURNISHING MATERIALS



It's the SHAPE that counts!

Flutes of Industry's twist drills are often burnished with Abbott Burnishing Balls and Pins for better wear, greater accuracy and less breakage.

Abbott Burnishing shapes—Ball, Ovaloll, Cone, Diagonal, Pin—are scientifically designed to make effective contact on metal stampings, castings and machined parts of any size or shape. Each is made from high quality, Abbott bearing ball steel, deep hardened and polished to a mirrorlike, glass hard finish. For all types of barrel burnishing . . . use Abbott.

WRITE for detailed information on how twist drills are burnished. Your inquiry brings prompt reply and new Abbott Catalog-Manual

ABBOTT

THE ABBOTT BALL COMPANY
1084 New Britain Ave.
Hartford 10, Conn., U.S.A.

Circle No. 15 on Reader Service Card.

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Manufacturers of Iridite Finishes
for Corrosion Resistance and Paint Systems on Non-Ferrous Metals; ARP Plating Chemicals.

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WET BLASTING

(Continued from Page 38)

A small electrical part is being plated in quantities of 5,000 to 10,000 lots. They are plated one gross at a time with .0005 to .0006 plate thickness in a 12 minute cycle. Total production rate is about 700 pieces per hour.

One important potential application of this process will be for cylinder linings of small, internal combustion engines. Many die cast aluminum cylinders are now in use for such applications as outboard motors, power lawnmowers and similar power plants. The conventional method of producing these is to cast or press in a steel or cast iron liner.

Still another type of potential application for chrome plate applied over aluminum may be the lining of shaft bearing holes. This would eliminate the need for pressed-in or cast-in bushings in some instances, thus simplifying die cast tooling and increasing the casting production rate.

As an external finish, chrome over aluminum may be picked up as a treatment for portable tools, household appliances, parts exposed to outdoor weathering, components of industrial machinery or building hardware.

The aircraft industry, increasingly dependent upon die cast aluminum for various small parts and fittings, may find that chrome plate will give hardness and friction resistance to aluminum to make it eligible for many additional purposes.

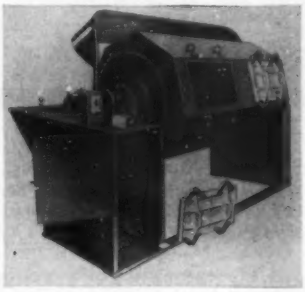
ELECTS LEVISON VICE-PRESIDENT

The Board of Directors of American Smelting and Refining Company has elected Stuart H. Levison vice-president in charge of zinc and coal operations.

Mr. Levison joined the company as an assayer at the Monterrey plant in Mexico in 1912, after graduation from Columbia University.

(Continued from Page 51)

versing starter are the only exposed parts. Limit switch permits operation only when hood is closed.



SPECIFICATIONS: Barrels are made in models ranging from 3 to 7½ hp, in constant speed and variable speed drives. Variable speed drives permit speed changes with barrel in motion. Foot operated hydraulic brake.

For additional information circle No. 105 on the Reader Service card.

BURRING OR MILLING DIE CASTINGS

Vulcanaire Precision Spindles
Vulcan Tool Co., Dayton, Ohio

SPECIAL FEATURES: These tools can be used for burring or milling die castings. Company reports that 10 micro-inch finish with carbide mills and 6 micro-inch finish with mounted points is maintainable on high speed production.

SPECIFICATIONS: Uses high speed air operated and cooled motor. The motor is 3-5/16 inches long. Heat and expansion are controlled by room temperature air and oil circulating through the grinder. Pre-loaded precision ball bearings. All parts made of alloy steel. Uses a small part of machine capacity.

For additional information circle No. 106 on the Reader Service card.

PENNSALT APPOINTS TWO

The Pennsylvania Salt Mfg. Co. has appointed G. A. Nelson works manager of the company's Wyandotte, Mich., plant and James M. McWhirter works manager of the company's southern plants, it was announced recently by William F. Mitchell, vice president.

C. R. SCHMITT APPOINTED

The appointment of Charles R. Schmitt as manager, lubrication sales department, has been announced by E. F. Houghton & Co. of Philadelphia, manufacturers of industrial lubricants, metal and textile processing products and leathers.

Large quantities of aluminum powder, normally used in making aluminum paint, are now being shipped to manufacturers of explosives. Blockbusters, naval torpedos, incendiary bombs and star shells are only a few uses of this important powder.

This new FREE booklet tells how two new types of Oakite-developed solvent detergents make it easier and cheaper for you to do many difficult metal-cleaning jobs. Here are some of the subjects covered in the booklet:

Cleaning metal between processing operations
Precleaning before painting or plating
Stripping paint
Providing temporary protection against rust
How to use Oakite solvent detergents:
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Soak-tank method — Manual method

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This $10,000 saving is "gravy" say tool engineers of F. C. Russell Company, makers of Thermoseal combination windows. "The saving in drills alone in the first 13 months use of these two Dumore units repays their entire cost!"

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Circle No. 12 on Reader Service Card.

INDUSTRY NEWS

NEW ALCOA EXECUTIVE CHAIRMAN

Roy A. Hunt, president of the Aluminum Company of America since 1928, was named chairman of the executive committee and I. W. Wilson, senior vice president, was made president of the company at a recent meeting of Alcoa's board of directors. Arthur V. Davis continues as chairman of the board. The board also elected Leon E. Hickman as vice president and general counsel of the company.

FOY HEADS METALS AND MINERALS BUREAU

Manly Fleischmann, administrator of the National Production Authority, has announced the appointment of Norman W. Foy as assistant administrator to head the Metals and Minerals Bureau, one of the four divisions of the NPA industries.

Mr. Foy, who was an official of the War Production Board for several years, heads the bureau which includes the Aluminum Division, the Tin, Lead and Zinc Division, the Copper Division, the Iron and Steel Division and the Miscellaneous Metals and Minerals Division.

DETROIT DIE CASTER PLANS EXPANSION

Clifford H. Simmons, president of the Universal Die Casting & Mfg. Co., Saline, Mich., has announced the appointment of Betteridge & Co., Detroit, as public relations counsel.

Mr. Simmons said that the appointment was part of the company's plans for an intensive expansion program. At present, the company manufactures parts for the automotive and plumbing industries.

HOUGHTON OFFICERS REELECTED

At the annual meeting of the stockholders of E. F. Houghton & Co., manufacturers of oil, leather, metal and textile products, in Philadel-

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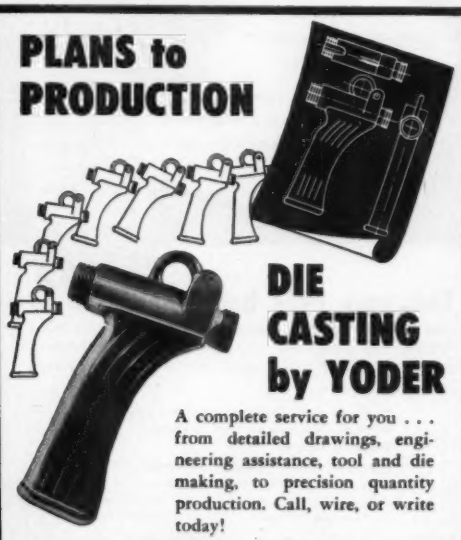
PLANS to PRODUCTION



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phia, the officers and directors were re-elected. These officers included A. E. Carpenter, chairman of the board, W. F. MacDonald, president and treasurer, R. H. Patch, vice-president, and D. J. Richards, vice-president.

BART-MESSING BUILDS NEW PLANT

The Bart-Messing Corp. has announced the acquisition of a new plant at 229 Main Street, Belleville 9, New Jersey. The plant has four times the space of the company's former building in Brooklyn, and will constitute the headquarters of the company.

The company manufactures a line of plating and polishing equipment and supplies.

WYANDOTTE ADVANCES FOUR

A new department, to be known as the Industrial, Railroad and Aircraft Dept., has been established by Wyandotte Chemicals Corp., Wyandotte, Mich. Dr. Roy E. Heath has been named manager of the new department.

Other Wyandotte men who have received positions in the new department include Robert J. Racine, manager of industrial sales; James L. Ramsey, manager of railroad sales; and Edward J. Kubis, who has been assigned to the technical service department.

SMALL BUSINESS GETS DEFENSE ORDERS

Total of military contracts for January, released by the Office of the Secretary of Defense, came to $3,984,000,000, which is four times the average for the previous six months. Small business' share of orders kept pace with this expansion.

Businesses employing fewer than 500 persons continued to receive 73 per cent of the number of contracts, and the dollar value of contracts for January awarded to small business, $661,000,000, was $422,000,000 over the previous six months' average.

LINDBERG OPENS OFFICE

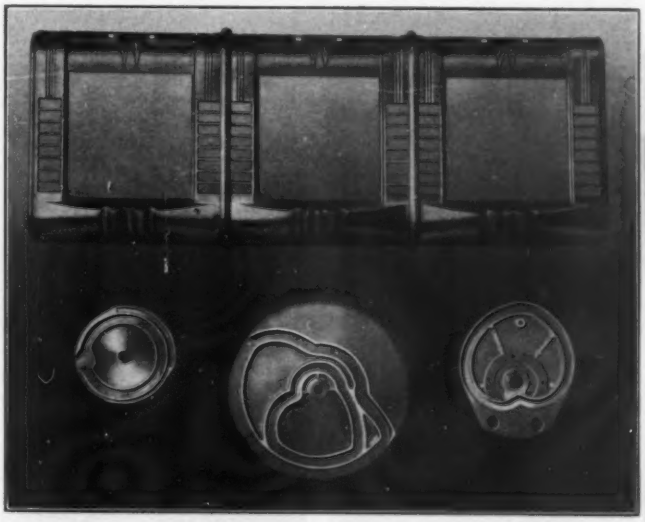
Lindberg Engineering Company, Chicago, manufacturers of heat treating furnaces and melting furnaces, announces the opening of a direct factory sales office in Atlanta, Georgia, starting June 1st.

Philip J. Duffy will be moved from the Chicago office to take charge of this office, which will cover the states of Georgia, Alabama, Mississippi and Florida.

OPPORTUNITIES

DIE CASTING MACHINES WANTED

Kippcaster die casting machines of all models wanted. Can use several machines in expansion program. Write Box 6151, Die Castings Magazine.



PRODUCTION SAMPLES ON THIS JOB WERE DELIVERED 7 WEEKS AFTER RECEIPT OF ORDER

Zinc die castings for a famous make record player illustrated above. The large casting at the top is approximately 12" by 30" weighing about ten pounds.

Cam tracks on lower castings were cast without draft and were held within .002. All parts were furnished ready for assembly.

Inquiries Invited

ACCURATE DIE CASTING COMPANY

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DOEHLER DIVISION HEAD BECOMES OPS CONSULTANT

Joseph L. O'Brien, sales manager of Doehler-Jarvis Corporation's Chicago Division, has been appointed consultant to the Office of Price Stabilization, Division of the Economic Stabilization Agency, it has been announced by E. R. Zabriskie, vice president and general sales manager.

Mr. O'Brien has been succeeded by William L. Huber.

ATOMIC SCIENTIST ELECTED MONSANTO PRESIDENT

One of the nation's leading atomic scientists, Dr. Charles Allen Thomas, has been elected president of Monsanto Chemical Company.

Dr. Thomas, who was prominently identified with the production of the atomic bomb and co-author of a plan for control of nuclear weapons, was chosen by Monsanto's Board of Directors, and will take office May 1.

ALCOA TO BUILD NEW ALUMINUM SMELTING PLANT

A new aluminum smelting plant, capable of supplying 170,000,000 pounds of aluminum annually for America's defense and civilian needs, will be built by Aluminum Company of America, at Wenatchee, Washington.

In announcing its plans, the company said that construction of the new works would begin immediately. It is hoped that the first aluminum can be produced at the plant within 15 months.

Announcement of the selection of a plant site followed completion of negotiations between the company, Bonneville Power Administration and the Public Utility District of Chelan County, Washington. These negotiations, entered into at the request of Defense Electric Power Administration officials, assure that necessary electric power will be provided for this urgently needed additional aluminum production.

NPA ABRASIVE CONSULTANT

Ralph O. Anderson, Norton Co. district manager in St. Louis, has been appointed by the National Production Authority to serve in its machinery division as abrasive consultant.

Mr. Anderson will be on loan to the government as a representative of the abrasive industry. He has been with the Norton Co. since 1922, serving as an abrasive engineer and district manager of various territories in the midwest and southwest sections of the country.

R. O. Anderson

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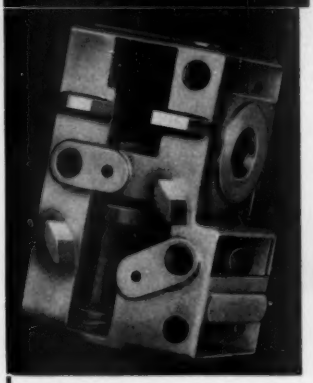

MECHANISM FRAME for precision instrument. Aluminum alloy die casting, weight 7 ozs. Complex shape with inside projections were obtained by intricate coring.

10-inch balanced BLOWER FAN with V-Pulley. One-piece zinc alloy die casting.

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PHONE ARMITAGE 6-4803

(Continued from page 34)

ess further enhances this feature by permitting thinner, more uniform walls. Total weight has been reduced by approximately fifty percent which represents a worthwhile saving in shipping costs.

The simplified work schedule presented in Table 1 will give some idea of the general saving in time, labor and tooling accomplished by replacing the sand cast housing of a former model with a die cast assembly.

This description of the die cast blower housing tells only half the story because some equally interesting die cast zinc components are used in the Model Fifty-Ten. In fact, it

6. AFTER THE OIL BURNER IS ASSEMBLED, it is sprayed as a unit. Hammer type metallic paint is used.

would be difficult, if not impossible, to produce the fuel unit without using the three zinc die castings shown in Figure 4.

These die castings which make up the fuel unit housing and the valve housing have some intricate internal passageways produced by coring. The schematic diagram, Figure 5, showing a small portion of the valve and fuel housing will give some idea of the complexity of these internal channels for oil and air.

The arrows in Figure 4 point to the two sets of small channels. These ports are all cored, with diameter of 0.100 and a length of about 1.5". One of these small-diameter cores is unsupported at its inner end.

At first, an attempt was made to drill these ports through solid sections of the die cast metal, but the problem of porosity in the center of the thick section resulted in an excessive number of rejects. The die caster then undertook the difficult job of coring these holes, and despite the small diamenter of the cores, and the unusual length in proportion to diameter which far exceeds standard die casting recommended practice, he has been able to produce parts with sound structure. The porosity problem has virtually been eliminated.

A close inspection of Figure 5 will reveal that the coring of these holes has not been simple, for although the five holes enter the housing parallel with each other and equally spaced, they are joined with mating cores in a perpendicular plane at widely varying portions of the housing.

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It can be appreciated that the problem of bleeding of oil under pressure from one port to another would be a serious problem, and the closest attention has been paid to obtaining sound castings. The die caster has been able to meet these specifications, and a one hundred percent inspection of these die castings at 75 pounds air pressure turns up very few rejects due to porosity.

These units are subject to approval of the Underwriters Laboratories, Inc. This approval has been granted with provision that the zinc die castings be given a chromate treatment to protect the surfaces from the corrosive effect of fuel oil. This simple dip treatment results in a passive, non-reactive surface.

As can be noticed in Figure 4, as much extra metal as possible has been cored out. This not only serves to economize on the amount of metal used, but also results in sound castings due to greater uniformity of sections.

It is doubtful that a fuel unit such as this could be produced economically in large quantities by any method other than die casting. The amount of machining which would be required, and the difficulties which would be encountered if this unit were fabricated by any other method, would certainly be prohibitive.

CITY DAILY NEWS
YANK SUPER AIR POWER DOWNS ENEMY PLANES
ACCURACY OF FIRE POWER BEATS ENEMY
New Device Assures Greater Fire Accuracy
Many air victories were made possible through the engineering "miracles" developed by American industry. We are proud to have had a part in producing the famous automatic sighting devices used by our air force.
Our recently expanded facilities and modern equipment enable us, once again, to serve both the defense and civilian needs of our customers.
DIE CASTING CORP.
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CLOTH CUTTER

(Continued from Page 30)

hold the hinge pin for the toe plate are cored to size. All openings for the cutter blade and for mounting the superstructure are formed in the die. For reinforcement to assure flatness and rigidity, ample ribbing has been provided on the underside of the slightly curved shell for the base.

The few examples described and illustrated here may give some idea of the character and range of parts now being die cast for Maimin cloth cutters. This company has been in business since 1892, and has earned a leading name in the textile machinery field. It was a sign of its progressive character that the Maimin company decided to take advantage of the die casting process many years ago, long before die castings had achieved such wide acceptance for use in practically every field of metal goods manufacturing. The wisdom of this early decision has paid off many times in quality of product, in economy and in reputation for leadership.

SAFETY MANUAL

(Continued from Page 31)

appendix showing sample accident report forms and records, safety placards used in some of the industry's plants and blue prints of safety devices used in the industry for die casting and finishing machines.

Although the manual is drawn from the experiences of the entire industry, the actual preparation work was done by the Institute's Safety Committee. Active members of this committee were Charles A. Sanford of the Cleveland Hardware & Forging Co., chairman, Norman Dress of the Precision Castings Co., Inc., and Byron S. Van Horn

of the Doehler-Jarvis Corp. Corresponding members were J. M. Davis of the Union Die Casting Co., Ltd., Henry Schroeder of the Milwaukee Die Casting Co., Thomas Walker of the Mt. Vernon Die Casting Co., and Lewis Turner of the Dollin Corp. David Laine, secretary of the Institute, worked closely with the committee.

The manual is printed in two colors, and is contained in a looseleaf cover, rather than a book binding. This will permit the executive responsible for safety in a plant to include notes of his own, along with special plant rules and other pertinent data. The manual is priced at $5.00, and can be obtained from the American Die Casting Institute, 366 Madison Ave., New York 17, N. Y.

GLASS FRAME

(Continued from Page 21)

faced with a similar problem of framing a dial, indicator or display rack, the experience of Erie Meter Systems may suggest a way in which die cast frames can be useful.

Here, the effectiveness of the frame depended upon its ability to match the contour of the joint surface of the sheet metal cabinet door or panel. Dimensions of the die cast aluminum frame to fit around the 11"x22" dial opening are approximately 13"x23", including the 1-inch frame width.

The part is die cast with all holes cored around the perimeter for attaching with self-tapping screws. This use of an inherent feature of the die casting process—the ability to core holes that are accurately located and sized—has eliminated the need for drilling and tapping operations on a large number of holes.

These self-tapping screws fasten the glass cover and the advertising plate in position by means of pressed steel clips. The advertising plate beneath the glass cover displays the symbol and brand name of the gasoline being sold.

The frame is also cast with 12 lugs around the edge which are drilled and tapped. These holes cannot be cored readily because they lie at an angle with the die parting. The cost of coring and die maintenance for such holes would exceed the cost of drilling them. These holes are used to fasten the dial assembly to the cabinet panel.

The finishing operation is fairly simple. The surface is ground to remove die marks and flash and to give a uniform surface with slight tooth for paint adhesion. Following a solvent cleaning operation, the prime coat is sprayed and, after baking, an enamel coat is applied whose color matches that of the cabinet. This coating is also baked at a temperature ranging from 275F to 300F, depending upon the specific color and paint specifications.

The entire assembly operation is expedited because the pane of glass and the advertising plate are mounted onto the die cast frame which is then fastened to the door panel as a unit on the

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"Bobbin Chute"

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main assembly line. A narrow gasket is cemented along the edge as a seal between the frame and the panel door.

For replacement of units already in the field, the company furnishes templates for drilling holes for attaching the die cast frame to the cabinet.

HANDLES

(Continued from Page 24)

incorporated into the die and formed without secondary processing.

Likewise, on a drawer pull or long handle, complex curvatures to conform to the fingers or to offer slip-proof grip can be incorporated into the design. Forms are not limited to surfaces of rotation, as is the case with screw machine knobs.

Decorative treatment — Die casting produces an impression having perfectly clean detail and permits the reproduction of a great amount of detail, lettering, insignia or, in fact, anything which can be engraved, hobbed or machined into the die.

This makes decorative detail for furniture handles easy to obtain, and likewise, company names and trademarks. This can be either intaglio or raised relief, although the latter is less expensive for tooling because raised lettering or designs can be incised into the die.

Variations of treatment — Provision of plugs in the die make it possible to change detail. Thus, the same basic cavity can be utilized for several models, saving on tool investment.

Cold formed shapes — The ductility of zinc alloy comes to the rescue of the designer sometimes, not only for fastening as referred to above, but also for obtaining shapes difficult to die cast directly.

A round knob can be die cast as a cylinder and spun into a sphere, thus getting the round handle without the waste of valuable metal which would be the case if cast solid. The same trick has been used successfully for long drawer pulls, such as stove drawer handles.

Variations in Finish

Considerable variation in types of finish which are available for die cast handles and knobs also is at the command of the product designer. Whether his job is to protect the knob or handle from the corrosive effects of moisture and perspiration, or the more decorative demands of furniture hardware —or a combination of the two objectives, there are plenty of suitable finishes available.

Plated finishes — Despite metals shortages, there are still a number of plated finishes available, and some substitute organic coatings which provide a suitable replica for many purposes. Zinc plate over zinc die casting, followed by a clear dip,

SLIDING HANDLES FOR DOORS provide a means of incorporating a latch mechanism. Assembly problems are simplified by casting the attaching as part of the handle.

gives a brilliant metallic lustre that is durable and chrome-like. It is also possible to plate with chromium directly over zinc and then bring up the color with a buffing operation.

Painted finishes — Although organic coatings are less widely used for handle coatings than metallic platings, there are a number of such finishes which have displayed high resistance to corrosion and abrasion, and

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are therefore suitable for some handles.

Manufacturers of appliances have recently found hammer type baked enamels an economical and acceptable finish for handles which, though lacking some of the reflectivity of plating, compensate by lower production costs.

Anodic finishes—Mainly of interest as a method of finishing low-silicon alloys of aluminum, anodizing has been successfully used for giving bright colors. This controlled oxide coating is resistant to wear and corrosion, but is limited in application because the presence of silicon causes streaking and greyness.

A strictly protective use of anodizing is possible for zinc, producing an iridescent yellow or olive drab. This has been used successfully for control knobs on liquid petroleum equipment, among others.

Mechanical finishes — Bright lustre brought up by barrel finishing, or satin matte achieved by scratch brushing, abrasive blasting or other methods, have been successfully tried on aluminum die cast handles and require no further treatment.

ZINC CONFERENCE

(Continued from Page 27)

1936—from the $41 million then, to the $225 million in 1950—550 per cent increase. That figure is for total die castings sold. Zinc die castings sales increased from $26 million to $135 million — about the same proportion. Incidentally, zinc die castings $135 million sales in 1950 are over three times our total volume in 1936 and higher than our total volume of all die castings in any year up to 1946.

. . . "In 1947 I talked of 264,000 tons of special high grade for die castings and it seemed

an astronomical number, but it has already been surpassed; and as to the future—well, let's do some more looking first.

"I have here another exhibit (Figure 2) which takes the 170,000 tons of zinc-base die castings that we sold in 1950 and shows where they went, by end use. It indicates the customer industries we serve and how many pounds out of the 340 million pounds each of these groups used.

" . . . During World War II, millions and millions of zinc die castings were used by the Armed Forces. Very large quantities were for ordnance items, and that means a shooting war. So while it keeps our volume in the National Defense class low, it is still a good reason."

JEWELRY EFFECTS

(Continued from Page 26)

blemishes or deep foliation. Such defects require heavy polishing which too frequently opens up subsurface porosity preventing a successful plating job.

Finishing cycle used for the die cast horn mountings starts with a light polishing using a 240 grit abrasive belt on a wheel with backstand idler. Wheel speed of 2600 rpm is used.

The castings are then buffed with tripoli on a bias buff at wheel speed of 2600 rpm and, after cleaning, they are ready for the plating cycle.

Plating cycle is 15 minutes copper, 20 minutes nickel and 5 minutes chrome, producing a plate with the following specifications: copper .0003, nickel .0004 and chrome .00001.

The products described above are only two of the thousands of individual items manufactured by The Fox Company, but they are typical of the care and ingenuity employed in assembling and finishing throughout the entire production line.

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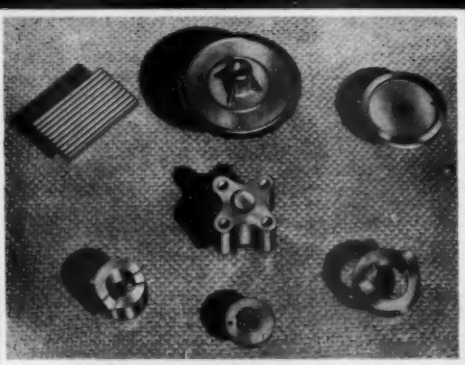

SIMPLE DIE CASTINGS LIKE THESE REPRESENT SAVINGS TO 50%

To die cast parts economically many believe complicated dies are required. On the contrary, comparatively simple dies for parts can be used to die cast them at lowest cost conditions. The die casting method even for these parts of simple design still greatly saves time, material and much of the labor otherwise required for machining and finishing. Using the new lightweight, yet tough, aluminum and magnesium alloys, which are still available for many uses, may solve your production-cost problem.

Illustrated above are a few die cast parts of simple design which were previously made as extrusions and sand castings. However, the extensive machining formerly required, plus their original high cost per pound of materials, made them "naturals" for die casting. In addition, die cost is low. The simple, die casting, therefore, is an inexpensive starting point for those few machining operations required for finishing.

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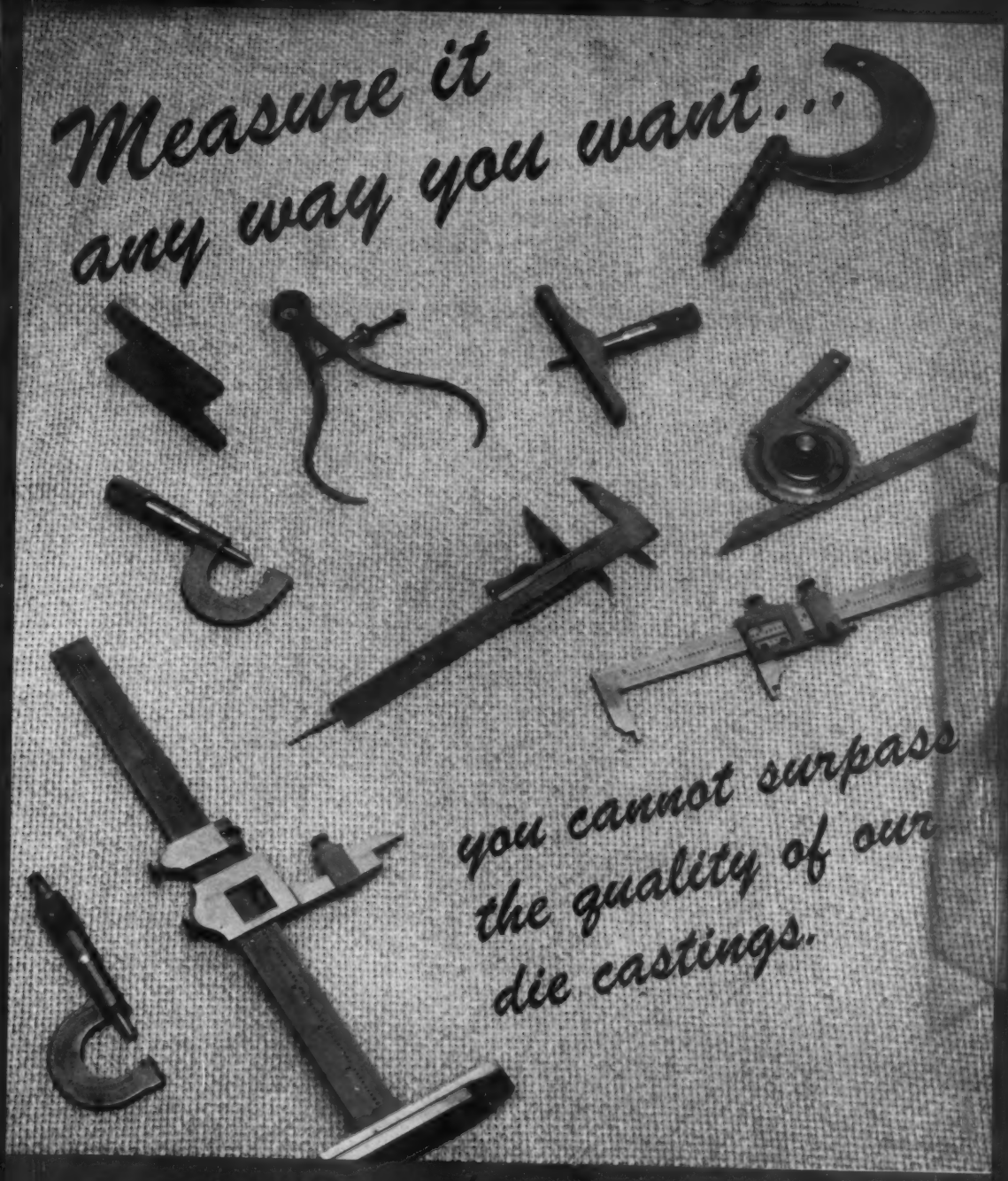

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